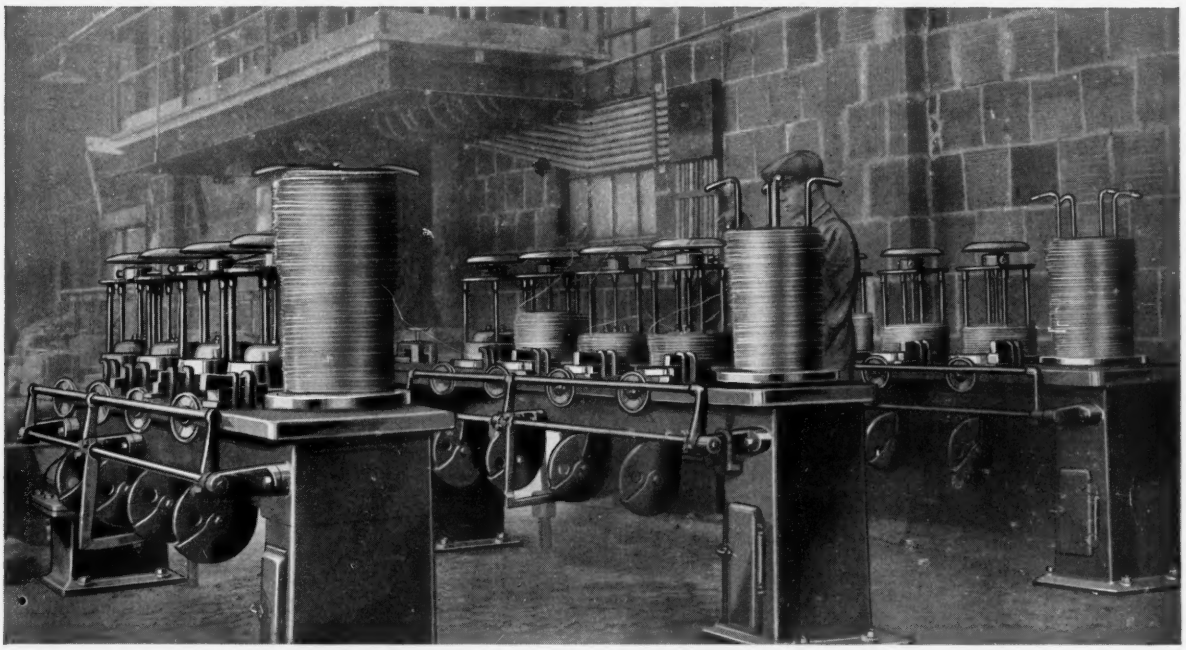
WIRE & WIRE PRODUCTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION



Williamsport Wire Rope Co. operates at Williamsport, Pa., a large, modern rope plant. The wire drawing machinery is of Morgan type throughout, this illustration showing a battery of Morgan-Connor machines finishing rope wire in sizes 020 to 042.

MORGAN CONSTRUCTION COMPANY, Worcester, Mass., U. S. A. MALMEDIE & COMPANY, Dusseldorf, Germany Sole Licensee for Morgan-Connor Wire Machines in Europe

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July 1932

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A diversified program of papers prepared and delivered by experts—plant operators, engineers and executives from all divisions of the wire industry will be presented on October 4, 5, 6 and 7. There will be separate sessions relating to the production of steel rod and wire; the production of non-ferrous rod and wire; the manufacture of covered wire and cable and the fabrication of wire products. An open discussion will be held on all papers presented. You are invited to send suggestions for subjects to the Program Committee.

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WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip. Wire Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING.

Vol. 7 **July 1932** **No. 7**

Designated as

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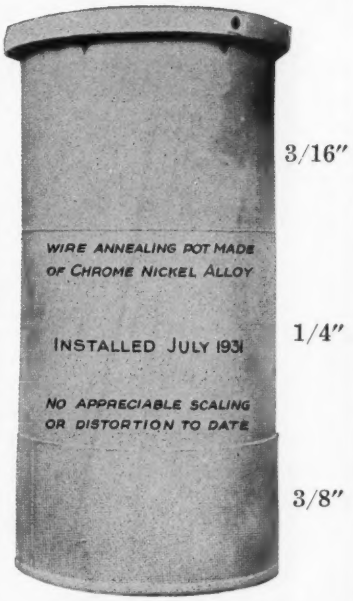

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WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 7 JULY, 1932 No. 7

Wire Industry Preparedness Plan For National Defense

Richard E. Brown
Secretary the Wire Association, New York, N. Y.

The Wire Association Acting Under Authority of the Assistant Secretary of War in Charge of Industrial Procurement Planning, Undertakes the Compilation of Production Data Essential to Military and Naval Services in Time of Emergency.

THE wire industry preparedness plan for National Defense outlined in the article published herewith, is designed to place in the hands of the proper procurement officers of the War and Navy Departments essential information regarding the productive capacity of the various mills in the United States drawing wire and producing insulated wire and cable, wire rope, etc.

✦ ✦ ✦

WITH the data resulting from this plan properly tabulated and arranged, the duplication of effort which existed among various procurement divisions of the Military and Naval services during the last war will be eliminated, and in time of need, emergency demands for wire will be handled so as to interfere as little as possible with the ordinary commercial business of the mills and yet in such a manner as to insure a sufficient volume of orders to keep every plant in the industry in constant and uniform production.

The term "primary requirements" as outlined in the article following, denotes wire that is purchased as such direct from the mill by the Army and Navy.

BY "secondary requirements" is meant wire which is sold by mills to other mills in the normal manner of commercial practice for refabrication or combination with other materials, in the production of primary military requirements.

✦ ✦ ✦

Purpose of Survey

The purpose of this survey is to determine the ability of the industry

a. To meet the primary requirements.

b. To enable the mills to maintain a constant supply to industry of wire for secondary requirements.

✦ ✦ ✦

A tabulation of the wire requirements of the War and Navy departments in time of emergency has been prepared by the War Department Commodity Committee No. 51, Frank W. Bullock, 1st Lieut. Signal Corps, U. S. A., chairman and is issued by authority of the Joint Procurement Board of the War and Navy Departments. The data will be presented to the industry through the Industrial War Planning Committee of The Wire Association, Mr. L. D. Granger, of Wickwire Spencer Steel Co., chairman. Richard E. Brown, Secretary the Wire Association, Secretary, acting under such authority.

✦ ✦ ✦

THIS tabulation will give the wire industry the following information:

War Department Requirements

Bare Wire—Ferrous	Class I
Bare Wire—Non-Ferrous	Class II
Insulated Wire	Class III
Wire Rope	Class IV
Miscellaneous Fabricated Wire	Class V

Navy Department Requirements

Bare Wire—Ferrous	Class I
Bare Wire—Non-Ferrous	Class II
Insulated Wire	Class III
Wire Rope	Class IV
Miscellaneous Fabricated Wire	Class V

IN order to enable each plant to determine its capacity for meet-

ing emergency demands, a complete set of these wire requirements will be mailed within the next few weeks.

✦ ✦ ✦

ACCOMPANYING this tabulation will be two questionnaire sheets requesting the following information:

a. List of items which the plant is best equipped to produce.

b. Details of the following:

1. Normal monthly capacity.
2. Normal operating hours per week.
3. Products consumed in own organization.
4. Product marketed directly to commercial customers.
5. Reserve capacity available for additional production in event of emergency.

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ALL data supplied will be held in confidence and all companies sending in the information requested will be immediately placed on the list of preferred bidders of the War and Navy Departments for current peace-time business.

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COMPANIES supplying the data requested will also be supplied with the names of the individual officers in charge of wire purchases in the different specialized services of the War and Navy Departments, should they desire this information.

THE data which will be mailed to each plant will place in your hands full information as to the wire requirements of the Military and Naval services of the United States. The cooperation of the plant in furnishing the desired information to the Government will not only be of direct benefit to the companies complying with the request for data but should also be considered as a patriotic duty.

Richard E. Brown, publisher of WIRE & WIRE PRODUCTS will act as Secretary to the committee. All requests for information should be mailed to him at 551 5th Avenue, New York.

WAR DEPARTMENT

OFFICE OF THE ASSISTANT SECRETARY

WASHINGTON, D. C.

June 23, 1932.

Mr. R. E. Brown, Secretary,
The Wire Association,
551 Fifth Avenue,
New York, New York.

Dear Sir:

I desire to avail myself of this opportunity to express through you to the officers and members of The Wire Association my sincere appreciation of your patriotic offer to cooperate with the War Department in its work of planning for the mobilization of industry for the production of wire products for the Army and Navy in an emergency.

Your assistance will be an invaluable contribution to industrial preparedness, and it is with pleasure that I accept on behalf of the War Department the services of The Wire Association.

Very truly yours,

F. H. Payne

F. H. PAYNE,
The Assistant Secretary of War.

Wire Industry Vital to Industrial War Planning

By Frank W. Bullock

1st Lieut. Signal Corps, U. S. Army
Chairman of War Department Commodity Committee on Wire and Cable of the Office of the Assistant Secretary of War.

(Member of the Wire Association)

The Wire Industry is of Vital Importance in War Planning Because Wire in Some Form Enters Into the Fabrication of Every Item of Military Equipment and Communication Systems. ▲ ▲ ▲ ▲ ▲ ▲ ▲ ▲

I--Discussion General

UNDER the National Defense Act, the military and naval establishments of the United States are charged with a two-fold responsibility, first to preserve peace with security, and second, to restore peace should it be forcibly violated. For the discharge of this responsibility but two resources exist, men and matérial, and the first or peace time function of the military establishments includes the duty of preparing plans calculated to make possible the prompt and effective use of these resources, if and when needed.

The effective use of the nation's man power for defense, is dependent upon our ability to provide men with, and train them in the use of, those material things without which they cannot fight, and the people, by the enactment of law, have demanded positive assurance that this will be accomplished. To provide this assurance, the military establishments, and that complex fabric which for lack of a better description we call Industry, are charged with a joint responsibility.

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II--Industrial War Planning

INDUSTRIAL War Planning, sometimes called "Industrial Mobilization" is that work undertaken by and under the direction of the Assistant Secretary of War in accordance with the National Defense Act, to assure adequate provision for the mobilization of matérial and industrial organizations essential to war time needs.

It consists of the collection and classification of information relative to requirements, sources of supply and potential production, and the preparation of plans for the prompt procurement and distribution of the necessary munitions of war.

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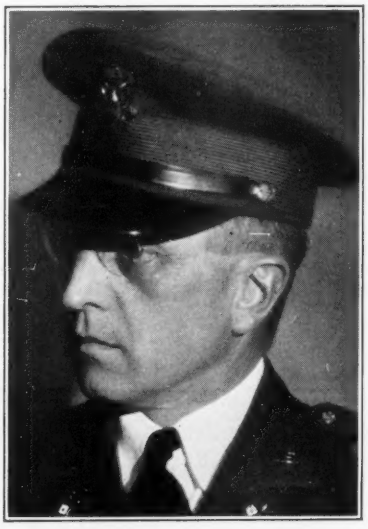
THE powers and duties of the War Department with respect to industrial war planning are set forth in the National Defense Act, as follows:

Sec. 5a—

'Hereafter, in addition to such other duties as may be assigned to him by the Secretary of War, the Assistant Secretary of War, under the direction of the Secretary of War, shall be charged with supervision of the procurement of all military supplies and other business of the War Department pertaining thereto and the assurance of adequate provision for the mobilization of matérial and industrial organizations essential to war-time need. * * *"



FRANK W. BULLOCK
1st Lieut. Signal Corps, U. S. Army
Chairman of War Department Commodity Committee on Wire and Cable of the Office of the Assistant Secretary of War.
(Member of the Wire Association)

✦ ✦ ✦

"The Secretary of War shall also make, or cause to be made, a complete list of all privately owned plants in the United States equipped to manufacture arms or ammunition (This includes all other essential military supplies.) or the components thereof. He shall obtain full and complete information regarding the kind of arms or ammunition, or the component parts there of, manufactured or that can be manufactured by each such plant, the equipment in each plant, and the maximum capacity thereof. * * *"

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SINCE the actual purchase, storage and distribution of military supplies in peace and war is carried out by the procuring arms and services of the Army and the supply bureaus of the Navy most of the work of industrial war planning is carried on directly by these agencies. There are, however, certain classes of supplies, which by reason of unusually large requirements, uncertain character of sources of supply, or dependence of this country upon foreign sources for raw materials essential to their production, require special

study and consideration. To carry out such special studies, and for the preparation of plans for the procurement of critical commodities, the Assistant Secretary of War has set up within his office special fact finding and planning groups known as commodity committees, which are described as follows:

War Department, Office of The Assistant Secretary of War Notes on Industrial Mobilization No. 13.

VIII Commodity Committees

"1. War Department Commodity Committees are units of the Office of The Assistant Secretary of War and are directly responsible to him. Each is composed of a representative from those of the supply branches (Arms, Services and Bureaus) having requirements for the commodity from which it takes its name, a Chairman selected by the branch responsible for the procurement of the commodity, and a Technical Advisor from the Office of The Assistant Secretary of War."

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"3. The Commodity Committees carefully consider the consolidated War Department requirements in connection with estimates of other requirements, such as naval, civilian, etc., and the available resources, and estimate the extent of the difficulty, if any, that would be experienced in meeting these requirements."

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NATURALLY the work of the Commodity Committees and that of the procuring arms is in many instances identical in character, which has led to a certain confusion of mind on the part of industrial executives and has perhaps been somewhat annoying to the heads of busy organizations. One cannot fail to appreciate the irritation which two or three or a dozen requests from as many government agencies for exactly the same information, would occasion in the mind of any busy executive who wasn't quite sure with whom he was dealing. Realizing that this condition was seriously hampering progress in planning, the Assistant Secretary of War, on May 9, 1923, issued the following instructions:

"Questionnaires":

"Hereafter no officer engaged on procurement planning or a commodity study will request information, in writing, from Government Departments, Chambers of Commerce, Trade and Technical Associations, Corporations or Business Firms unless he is personally acquainted with the business man addressed. Where requests for information are not of such a personal character, contact must be established through the personal visit of a regular officer or a reserve officer."

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III---Wire and Wire Products

DURING the late war, the procurement of wire and cable for the Army and Navy presented a number of serious problems none of which was entirely solved, prior to the cessation of hostilities. It was apparent, however, that wire and wire products, considered as a single commodity group were of such outstanding importance as to warrant intensive study. War department Commodity Committee No. 51, was therefore placed upon an active status and charged with that study. The wire and Cable Committee has, since 1927, been engaged in preparatory work leading to the formulation of a general wire plan.

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STUDY of military requirements has disclosed two significant facts; first, that direct requirements for wire and wire products, that is, items procured by the supply services directly, represent only approximately seventeen per cent of the total war requirements, and second, that in terms of **kind**, not quantity, most of the direct requirements fall naturally into everyday commercial classifications. It has been suggested that items of wire of commercial types should present no unusual problem in procurement, and, considered individually such conclusion is undoubtedly true, but these items when considered as part of an emergency overload, to be absorbed by facilities which may already be fully occupied, do present a serious problem. Further, it must be remembered that the major portion of our war requirements are not procured directly by agencies of the Government, but pass to manufacturers for fabrication into other military supplies, through the ordinary channels of trade. It is apparent, therefore, that the success of a defensive effort is in a measure dependent upon our ability to keep these ordinary trade relationships unimpaired. The immediate problem of the Commodity Committee resolves itself into the distribution of direct requirements to the wire industry so as to:

(1) Assure the supply of what we need and when we need it.

(2) To cause the minimum readjustment of the regular production and sales machinery of the plants affected.

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IV---Scope of Proposed Wire Plan

TO satisfy the above conditions it is believed that a general plan for the direct procurement of wire and wire products by the Government should include the following progressive steps:

A. Assemble direct requirements, expressed in quantity and time.

B. Classify direct requirements:

(1) As to procuring service,

(2) As to kind, applying commercial classifications as far as practicable.

C. Survey the wire industry for capacity actually available, and for potential capacity under some system of coordination

D. Apportion direct requirements to capacity giving particular consideration to:

(1) Minimum readjustment of commercial production and sales.

(2) Elimination or limitation of joint apportionments of the capacity of a single facility to two or more procuring services.

(*Please turn to page 239*)

Fourdrinier Wires and Cloths

By Kurt Jahn, Köditz, Germany*

Part II. of a Research Paper Outlining the Requirements For Fourdrinier Wires and Fourdrinier Cloths. ▼ ▼ ▼ ▼

Warp and Filler Wire For Fourdrinier Fabrics

BELTS for paper making get severe service. For this reason great care is necessary in their manufacture, and their individual wires must meet the most exacting tests.

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Testing of Wires

THE primary requirement in a Fourdinier belt is absolute uniformity. To secure this, all wires entering into the construction must be tested with great accuracy for ultimate strength, yield point elongation, bending, and resistance to abrasion. Whether for the warp or the shute filling, wires must be uniform. Hence the composition of the alloy is of great importance.

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IT is obvious that if a hard and a soft wire lie side by side in the belt, the first will crimp less in the weaving. Such wires, whether warp or filler will not work the same way; one will present a larger surface to abrasion, or will take upon itself a larger part of the pull, or will cause the wires which it crosses, to assume too much or too little crimp. This endangers the tenacity and life of the entire belt. It is important therefore to chose wires carefully according to their chief properties, breaking strength and elongation. These properties are established by tests in accordance with which the wires are classified so as to bring into a single belt exactly similar wires.

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*Translated by Kenneth B. Lewis.

II. Choice of Warp Wires

WARP wires must have the following characteristics:

(a) **Tensile strength.** The warp is subjected to considerable tension, especially over the suction box; being the only driven part of the machine it has to corry the fabric forward against the drag of

(1) All rolls, including the heavy breast-roll.

(2) The friction on the suction boxes.

(3) The braking effect of the deckle-strap.

That this tension is by no means negligible is proven by the fact that a 6 ft. wide fabric at a speed of 200 f. p. m. takes more than 11 horsepower. Doubling the speed raises the power somewhat more than in direct ratio, namely to 30 horsepower and the modern newsprint machines, at speeds of 750 to 1000 f. p. m. require considerably more power.

(b) **Bending.** The warp is working first straight-away and then over a radius. The effect is the same as a reverse bending test, which, carried to extremes, results in a broken wire, and the properties of the warp must be such as to withstand such treatment.

(c) **Abrasion.** If a fabric is gripped firmly in the fingers it will be noted that only the warp wires bend. As a matter of fact in the weaving process the warp does all the bending, and determines the thickness of the fabric, while the filler wires, less crimped, are not exposed. All the abrasion over fixed or resistant points of the machine falls on the warp wires, and their crimps (crowns). (fig. 1)

(d) **Chemical effect.** The paper pulp, as well as the acid used for cleaning the fabric, has a corrosive effect on the metal.

(e) **Elongation.** It is clear that the warp wires must crimp sharply during the weaving, without breaking, and that requires that the metal have good elongation.

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To sum up, the warp must satisfy these conditions:

High breaking strength.

Great elongation.

Least possible hardening by cold work.

Great resistance to abrasion.

Great resistance to corrosive action of paper making chemicals.

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IT is generally conceded that the alloy possessing the most effective combination of these properties is phosphor-bronze with 92 to 95% copper. This mixture is used almost exclusively for warps, with a tensile strength of 57,000 to 64,000 lbs. per square inch and a elongation of 44.5 to 50%. A smooth surface and good polish are valued, as promising a high elastic limit. The annealing must have been done right.

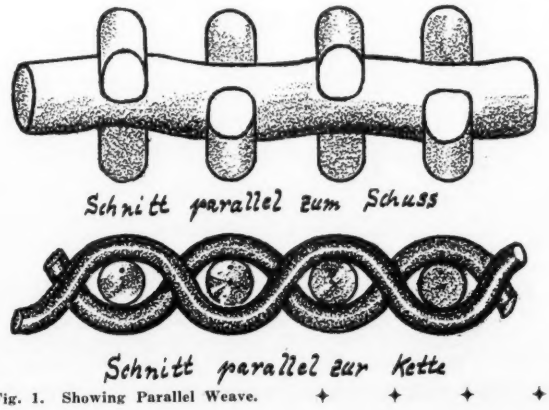

Fig. 1. Showing Parallel Weave.

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Choice of Filler Wires

DURING the run of a belt on a Fourdrinier machine there is a tendency, due to the heavy lengthwise pull on the warp wires, for the filler wires to bend, or crimp and thereby pull in the fabric to a smaller width. With this tendency in effect irregularly over the width of the fabric, it is apt to bulg into long waves. To avoid danger of this the filler must have sufficient stiffness, which is secured by using a somewhat larger gauge. The difference in size between filler and warp wires in the simple weave runs about .0008 to .0012 inch. For example for a No. 75 simple weave the warp would be bronze wires of .0084, and the filler brass wires of .0092. For a No. 65 the warp would be .0092 and the filler .0104. This relation gives a good weave and sufficient stiffness.

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THE filler, in order to take a good set with the warp, and to crimp just sufficiently, must be somewhat softer than the warp. These two mutually opposed properties, stiffness, (secured by gauge) and softness, call for the use of a suitable grade of brass, with a carefully calculated tensile strength and elongation. The alloy that best meets the requirements is a 67 to 75% copper, 33 to 25% zinc mixture, and the bulk of the tonnage falls within that range. Lately a good deal of Tombak (80% copper 20% zinc) has come into use. Close attention must be given to the final anneal to get the necessary properties.

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IT must not be concluded that a better fabric could be produced by using phosphor bronze for the filler. The greater tenacity of the bronze filler would force the warps to crown more sharply, and their destruction by abrasion would be hastened. Bronze filler wires are used only in special cases where for special reasons abrasion is not greatly to be feared. Care must be taken, as stated above, that bronze so used is not too hard, in which event it will fail to crimp enough, forcing the warp to crimp more sharply, and hence to present less surface and to wear faster in service. As continuous annealing does not produce a dead soft wire, filler wires in phosphor bronze must be pot annealed. It is important that they have a long soak and slow cooling in the pot. Before annealing, the wire is coated in a lime bath to prevent the sticking together of the coils. Pot annealed bronze wire does not have the beautiful finish of the continuously annealed, but it is very soft, weaves nicely, and beds nicely into the harder warp, and would logically give it support and help on the paper machine.

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THE Fourdrinier manufacturers of the U. S. and Canada follow their own ideas in the choice of warp and filler wires, as well as in other details. When corrosive influences are not important they generally use an alloy similar to Tombak, 80% copper and 20% zinc, soft annealed. Sometimes a 60% copper 40% zinc (high brass) is used. Only when corrosion is important do they use phosphor bronze, of 90-95% electrolytic copper, 10-5% Banca or Straits tin. For such a fabric there is an extra price of 5 cents per square foot. In the choice of gauges also the standards of the U. S. and Canada differ somewhat from those of Europe, as shown in the accompanying table A, which of course is to be regarded only as representing average conditions.

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IV. Winding Onto Warp Spools

THE wire to be used is commonly received from the wire mills in coils, from which it cannot safely be worked direct onto the warp rollers on account of the danger of tangling and breaking. It must therefore be spooled. For this work spooling machines of 10, 12, or 15 spindles are used, generally served by girls. (See Fig 2) The job is of course a simple one, consisting mainly of putting new bundles onto the reels, replacing full with empty spools, and straightening out tangles. Since a broken and spliced strand is unacceptable in the fabric it is important to avoid breaks, and these are really infrequent in properly drawn and bundled wire. Broken wires are spliced together with a "weaver's knot". These knots must be removed during weaving before they pass the reed, or there will be an irregularity at the knot which will affect the process and the life of the fabric.

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THE spooling of the wire is entirely automatic, and there is adjustment of tension to suit different diameters of wire. The spools are almost exclusively of

TABLE A

meshes per inch	U. S. A. warp	U. S. A. filler	CANADA warp	CANADA filler	application
14	.020	.021	same as	U. S. A.	cylinder
40	.01025	.01125	.0105	.0115	Coarse newsprint
50	.00975	.010	.010	.01025	newsprint
60	.009	.00925	.00925	.0095	newsprint
70	.0089	.00925	.00825	.0085	newsprint
80	.007	.00725	same as	U. S. A.	writing paper
100-120	0052/0045	slightly finer	same as	U. S. A.	fine paper

For coarse paper, wrapping, straw, carton, etc., cable weave is used.

EUROPEAN STANDARDS

mesh per inch (Rheinland)	warp	filler
40	.0104	.0112
50	.00955	.0104
60	.0088	.00955
60	.0104	.0112
65	.0088	.00955
65	.0092	.0104
70	.0088	.00955
75	.0084	.0092
80	.008	.0088
85	.0072	.008
90	.0064	.0072
100	.0056	.066

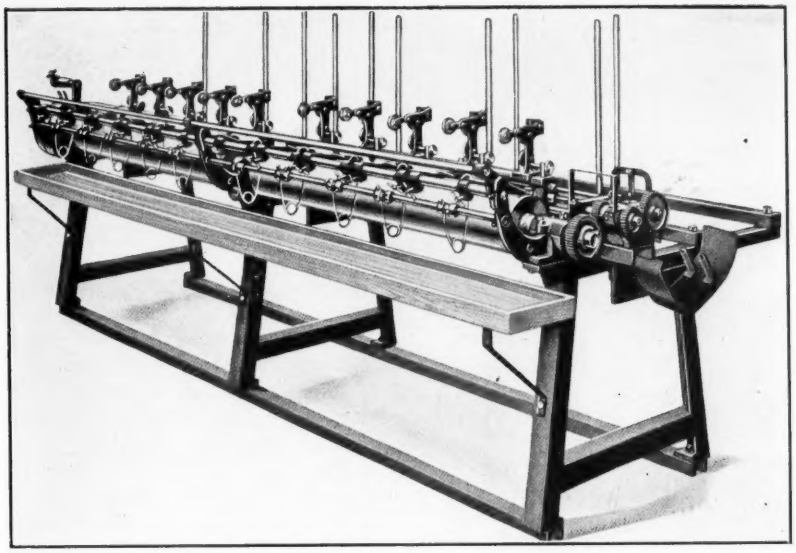

Fig. 2. Wire Spooling Machine For Winding Onto Warp Spools.

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wood, in the following dimensions:

Inside length, 4 inches.
Flange diameter, 3.6 inches.
Barrel diameter, 1.4 inches.
Flange thickness, .48 inches.

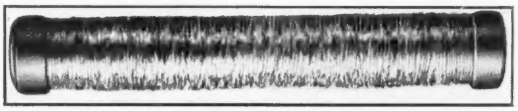

Fig. 3. Shuttles of Spool Type.

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Warp spools are also made of fibre board, in the following dimensions:

Inside length, 4.6 inches.
Flange diameter, 3.87 inches.
Barrel diameter, 1.36 inches.
Flange thickness, .32 inches.

The reels are of the ordinary type of wood or iron, with braking attachments.

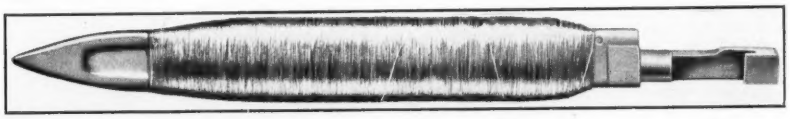

Fig. 4. The "Cop"

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CARE must be taken that there be absolutely no oiling or greasing of wires used for Fourdrinier fabric, such as is generally done in ordinary practice to make the wire run smoothly out of the coil. If the wire has a tendency to snarl it can be pulled over a felt pad moistened with benzine, but even this should be avoided if possible.

A 10 spindle spooler serves six looms.

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V. Spooling the Filler Wires

THE filling wire is usually wound direct from the bundle onto the shuttle, but some mills spool the wire first, to minimize breakage. Until a few years ago the shuttles were exclusively of the spool type (fig. 3). In recent years however the "cop" (fig. 4) has gained ground rapidly on account of its greatly increased carrying capacity. According to the Franz Irmisher Co. of Saalfeld, their latest cops carry 20 ounces. It is obvious that such a weight by reducing the number of stops for changing shuttles, increases the efficiency of the loom very considerably. For example, with such shuttles working a No. 70 mesh with .0096 wire and a fabric width of 10 feet, the run will be about 200 square feet, as against 38 square feet with the spool type. Experience shows that wire leading off the cop is in lighter tension than with the spool type.

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THE spooling of filler wires is done with automatic machines (fig. 5) which have generally been mounted in various groupings and tended by girls. Recently there has been a tendency toward mounting a spooler at each loom and putting it in charge of the weaver. As the operation is entirely automatic and each spindle stops when it has taken on the specified load, attendance is reduced practically to replacing full by empty spindles. There must be attachments to insure the stopping of a spindle with a tangled wire. If this wire breaks in spooling, the weaver does not knot it, but weaves whatever the shuttle carries. The filling of shuttles by the weaver appears to result in a net labor saving, and to be a forward step.

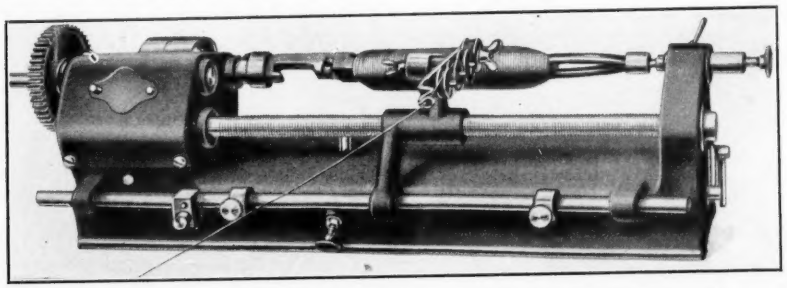

Fig. 5. Automatic Machine For Spooling Filler Wires.

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AT BUFFALO, N. Y.
DURING THE WEEK OF
OCTOBER 3, 1932

Steam Heated Rod Bakers

By Claude A. Bulkeley,

Chief Engineer, Niagara Blower Co., New York, N. Y.

The Efficiencies and Economies Effected by the Steam Heated Rod Baker---Outlined and Discussed. ▼ ▼ ▼ ▼

TO the average man any simple wire article, such as a wire coat-hanger or a lock washer, is just a cheap product to be carelessly used and thrown in the rubbish can. Actually these are two examples of commercial articles made from wire that is regarded as a high quality product in the wire mill. They are examples of a high state of development in the wire making industry.

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THE wire mill operator of today cannot have overlooked, and likewise failed to have been impressed with the radical changes in wire mill equipment and the many advances in the art. Comparing the present with five or ten years ago shows that practically all phases of the industry have received, and are still receiving, intensive development.

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THE situation has been brought about by pressure due to competition, by the strict specifications and requirements of the trade, and by the many new uses being developed for wire and wire products. Wire is now made from innumerable classes and grades of steel, which itself receives close supervision while being melted, cast into ingots, and rolled into billets and rods. This supervision becomes more intensified in the wire drawing department where the processes, equipment, inspection and tests which control the final size, finish, and strength of the wire, must be of high grade to meet the present day exact requirements of the customers.

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The Rod Baker

An important unit of equipment in any wire mill is the Rod Baker. Just to get the proper perspective let us review the process briefly. Starting with a hot rolled rod of proper size and grade of steel, the first step is cleaning. The rod coils are immersed in a hot acid solution to remove mill scale and rust. Following the acid bath comes a water rinse, and then a coating dip or process, which may be either lime, sull or copper or some combination of these. The cleaning and coating being a wet process, it is necessary to dry and bake the rods before any drafting is done to reduce the diameter.

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Acid Brittleness

EVERY pound of wire drawn must go thru this drying and baking process at least once. All grades of steel must be dried and practically all must be given a baking at comparatively low temperature to remove the effects of any hydrogen absorbed in the acid bath. Improperly baked rods are commonly designated as "acid brittle," meaning that they will break in the wire drawing die. The equipment for baking, therefore, becomes an important process unit. It is possible for the design of baker to adversely affect both production costs and quality of product. The type of baker which was suitable a decade ago, no longer fits the requirements of present day quality wires. Old type bakers have the outstanding disadvantages of irregular temperatures from day to day, uneven heating throughout the baker, uncertain capacity, and high cost of labor and fuel. They can be made to produce well baked rods but only at the expense of time and cost.

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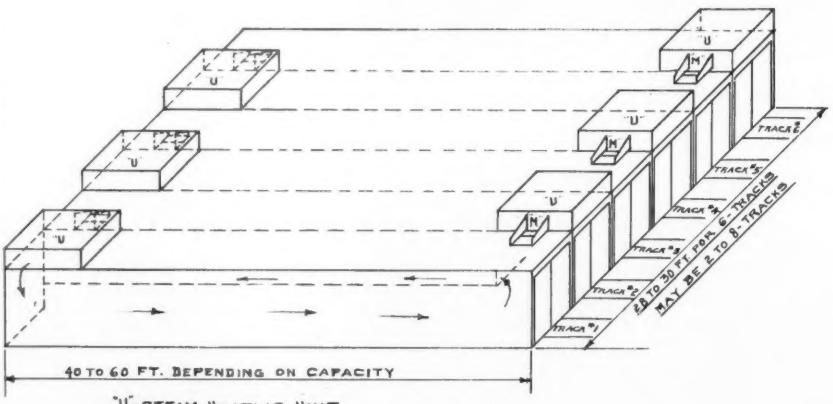
The Steam Heated Baker

THESE faults and shortcomings are claimed to have been overcome by the design developed in the Cramer Rod Baker, and several new features of value to the operator have been incorporated. This baker uses steam as the heating medium, and since rod baking and drying is essentially a low



Isometric Diagram—General Layout ✦ ✦ ✦ ✦ ✦ ✦ ✦

temperature process, steam as a heating medium offers an ideal solution.

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Operation Of Baker

THE accompanying isometric diagram shows the general layout for this Steam Heated Rod Baker.

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THE air is drawn from one end of the compartment through very efficient extended fin heating surface, by motor driven fans, and discharged into the opposite end, completing the circuit by traversing the length of the compartment. The entire air content of each drying compartment is thus forced through the stock in the compartment and heating surface, from four to five times per minute, or once every 12 to 15 seconds. By this very rapid change of air, heat is quickly transferred from the air in the compartment to the rods to be heated and dried, resulting in the rods quickly coming up to within 25° of the initial air temperature. Thus the stock is dried and relieved of any effect of hydrogen absorbed in the acid bath.

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DURING the unloading and recharging period, for each compartment, its fan is shut down and when the door are closed and the fan started up the compartment comes quickly up to temperature, due to the initial greater difference in temperature between that of the air and steam heating surface. This high transfer of heat results in a comparatively rapid heating of the rods. Since the temperature of steam at any given pressure is constant, it is impossible to overheat the rods even with out temperature control, for the reason that the higher the air temperature passing over the heating surface, the less will the air be heated and steam condensation (consumption) is thus automatically self limiting. If any operation requires a limiting rod temperature below 300° automatic control throttling the amount of steam to the coil can be furnished.

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Operating Advantages Claimed

ON account of the fast air movement through each compartment, once every ten to fifteen seconds, a rapidly changing and more intimate contact is obtained between the heated air and the rods. This has resulted in three things:

(1) A more uniform drying and removal of any hydrogen absorbed in the bath;

(2) A decrease in the time required for baking,

and

(3) A lower temperature required for baking.

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THE first advantage is inherent to the rapid air change and since the temperature is under natural limits, due to that of the steam, and can be controlled for lower desired temperatures, the second and third items are definitely under control, viz., a longer treatment at lower temperature or vice versa and may be required for special rods.

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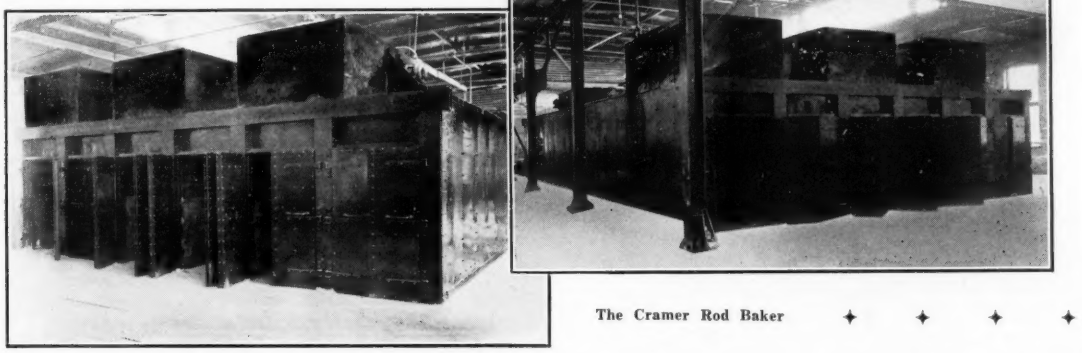
THESE bakers have each track separated by partitions, each compartment being furnished with its own unit for heating and circulating the air, thus each compartment can be operated independently as to time of service and temperature conditions required. For example, a six track baker can be equally well operated using any number from one to all six compartments and each compartment can, if required, be operated at a different temperature. Thus, flexibility of control of copacity and temperature has been attained as never before.



The Cramer Rod Baker ✦ ✦ ✦ ✦

IN actual operation these steam rod bakers have in a relatively short time been brought up from a cold condition to over 300° temperature with 125 lbs. steam. This avoids the customary long period required for heating up ready for service. This is due to the fact that the baker is built of light structural steel and sheets, with suitable thickness of outside insulation, making the heat absorbed by the structure relatively small and with little external loss, the latter giving good operating efficiency. Approximately 80% of the heat given up by the steam is applied to the heating up of the rods and buggies and in drying the stock.

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Operating Costs

FOR example, a six track rod baker 60 ft. long, having a capacity to treat 30 to 40 tons of stock per hour, requires about 4500 pounds of steam per hour.

(*Please turn to page 238*)

A New Heat Application for Galvanizing

W. H. Spowers, Jr.
Consulting Galvanizing Engineer
New York, N. Y.

The Application of "Diffusion Flame" Combustion to Hot Galvanizing Described. Work Can be Brought to Temperature With More Uniformity and Speed Than by Converted Heat Alone.

As a preface to this article in his review the Editor of "Industrial Gas" comments as follows:—

"IN "diffusion flame" combustion, a process which has been the object of intensive research, gas is made to burn with an intensely luminous flame, highly radiant within itself, and probably more responsive to control than any other fuel. The term is derived from and applied to those gas flames in which the air for combustion reaches the gas by *diffusion* through the flame proper, and not through any form of premixing. The flame proper thus becomes an intense source of radiant energy, whose luminosity results from the heating to incandescence by combustion of the surrounding gases, of the free carbon derived from the decomposed hydrocarbons. High emissivity factors are obtainable through efficient design of diffusion flame burners. As a practical result, a relatively low temperature head will enable a large portion of available furnace heat to reach and penetrate the work under heat. Radiant heat will also penetrate a wall of inert, non-combustible gases sometimes used to protect work from direct-flame impingement.

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IN such applications as hot galvanizing—described in the accompanying article—work can be brought to temperature with more uniformity and speed than by converted heat alone. Direct flame impingement with its destructive effect on the inner surface of the kettle is also avoided. In describing a characteristic wire-galvanizing installation designed on this principle, the author deals at length with the problem of side-fired vs. under-fired equipment, and shows conclusively by comparative data how too low firing, or firing from underneath the pot causes boiling of the dross with dangerously unstable bath conditions and a disproportionate percentage of dross resulting. Diffusion flame combustion is shown to be obtainable by an ingenious application of impact burners to a heat-radiating refractory bed installed between flame and side of kettle. Quality of product can be materially improved by proper dross control, and judicious fluxing."

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Diffusion Flame in Galvanizing

WITH the application of the diffusion flame to galvanizing settings it is believed that many of the difficulties heretofore experienced in heat transfer as applied to zinc kettles have been eliminated. This may be safely claimed to represent a significant advance in galvanizing technique because of the elimination of impingement difficulties, with consequent long life to equipment, with the best of bonding results and the low dross losses resulting.

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ONE of the oldest problems facing the hot galvanizing operation has been the length of life in the kettle itself. Improper heat application has always resulted in short equipment life and high dross losses. The reason for this is that improper transfer of heat through the kettle has aggravated the attack of the zinc on the inside of the kettle, and the dissolving of the kettle itself in the spelter resulting in dross; this of course always meant the rapid deterioriation of the side plates.

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ALONG with this problem we have been faced with the necessity of firing the installation so as to not only avoid any upward thrust of the dross but to actually produce a downward thrust, so that the working portion of the kettle might be as pure zinc as possible. In accomplishing this purpose recent installations of the deep kettle type have been exceedingly helpful, especially where the design has lent itself to a higher input of heat at the top, and lower input toward the bottom.

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IF we may take a straight wire galvanizing installation as an example the results may be easily shown. We might picture a shallow, round-bottom kettle heated from the bottom resulting in boiling dross, because, of necessity, any heat input at too low a point on the kettle or on its bottom thrusts the dross upwards because of the pressure of the heat against the natural tendency of the dross to settle.

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THUS we have a dross accumulation working against itself. This tendency of the dross to settle of its own weight to the bottom of the kettle leaves a pure zinc upper portion, or working portion of the kettle; but when we apply the heat from too low on the side or from the bottom, we work against this natural settlement and produce a boiling, or upward thrust on the dross. It has been shown that any boiling of this kind in the dross makes more dross, as it readily contaminates the pure zinc.

TO eliminate this very unsatisfactory situation and the resulting rapid deterioration in pot life, we have added to the depth of the pot and forced the heat through the sides of the kettle. In the most recent installations even this has been refined so that the great portion of the heat input is forced through the top third of the kettle, less in the middle third, and little or none at the bottom third. In this way we have produced a downward thrust on the dross with a relatively constant iron analysis at the top or working portion of the bath.

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IN order to definitely prove the inadvisability of too low, or bottom heating, the writer has made some very accurate experiments and desires to call attention to the following tabulation:

Designation of Charge	After Drossing		Before Drossing	
	Pan No.	Iron	Pan No.	Iron
Prime Western Spelter	1	.08	1	.132
Prime Western Spelter	2	.062	2	.172
Prime Western Spelter	3	.154	3	.21
Prime Western Spelter	4	.114	4	.19
Horsehead	7	.114	7	.286

✦ ✦ ✦

FOR this determination there were selected five shallow round-bottom under-fired straight wire galvanizing pans, four of which were charged with Prime Western spelter and one with Horsehead. Each one of these pans were drossed clean and sufficient time allowed for the settlement of any dross stirred by the drossing operation. Samples were then taken from the top of each one of these pans and analyzed for iron. The results are given in the column headed "After Drossing."

These pans were then worked for a period of a week when another reading was taken from the same points and under the same conditions at the top of the kettle. The second series of samples were analyzed for iron. The results from each pan are noted under the heading "Before Drossing." These results show very plainly the condition of the pans from the time they were assumed to be free of dross to the time when they were normally to be drossed again. It will be noted that the iron content of the fluid zinc at the top of the bath at the end of the tests runs materially higher in each instance than it was at the beginning. This proves the following facts: (1) under-fired, or too-low-fired equipment was used, resulting in boiling dross; (2) the wire put through these pans was coated with an increasingly heavy zinc iron throughout the period of the week. It may be safely claimed therefore that it is impossible in any hot galvanizing operation to produce a constant result where any such fluctuation in bath conditions exists.

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UNDER this state of affairs many installations ran as high as 35 per cent dross as calculated against new zinc used. We have succeeded in pulling this dross loss to as low as slightly under 1½ per cent. How was this done? It was done by converting these pans into deep equipment and applying the greater portion of the heat input to the top third of the kettle, and graduating the heat input to less in the middle third, and little or none at the bottom third. This has meant not only a tremendous saving in dross loss but the resulting addition to pot life. Samples of zinc taken from the top of the converted kettle show a constancy in the bath which has resulted in a perfectly uniform product.

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IN this discussion so far the author has referred only to the savings and benefits resulting in relation to the dross loss and kettle life. But important as these are they run scarcely second to the results in the product itself. It must be kept in mind that these installations which have been taken as examples are straight wire installations, and in this field ductility of the coating is of great importance. In this changeover there has been produced a constancy in the working portions of the kettle, and a uniform product; and because of the constantly pure conditions of the spelter which the wire is passing through, remarkably ductile coatings have resulted.

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OF course were this to be a complete discussion on galvanizing technique it would be necessary to dwell on other points in the process which have to do with bonding coats. For example, particular stress would have to be laid on the elimination of iron salt on the work entering the bath. In this connection the writer might refer for a moment to the development recently of the No. 20 galvanizing flux which eliminates the use of muriatic as a flux, and also eliminates the use of bath fluxes such as sal ammoniac and zinc ammonium chloride. The part played in the use of the technique developed for this flux is one of constancy of operation again which leads to uniformity of finished product.

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NOW, there have been so far outlined the results accomplished by reverting from under-fired equipment to side-fired equipment. This conversion was accomplished by applying the heat at the side of the kettle by means of a series of impact burners located well up on the side of the kettle and firing into a bed of refractory material. This bed of refractory material absorbs all the particles of combustion and the kettle is heated by radiation from this point. While this system of heat application has proved very successful and has been efficient in avoiding impingements, it has been done by means of installing an interference, as it were, between the burner and the kettle itself in the form of a bed of refractory materials; the latter releases the heat generated by the combustion in the form of radiation to the side of the kettle.

✦ ✦ ✦

BY the adaptation of the diffusion flame to the hot galvanizing process we eliminate all the impact burners from the side of the kettle and build a longi-

(*Please turn to page 236*)

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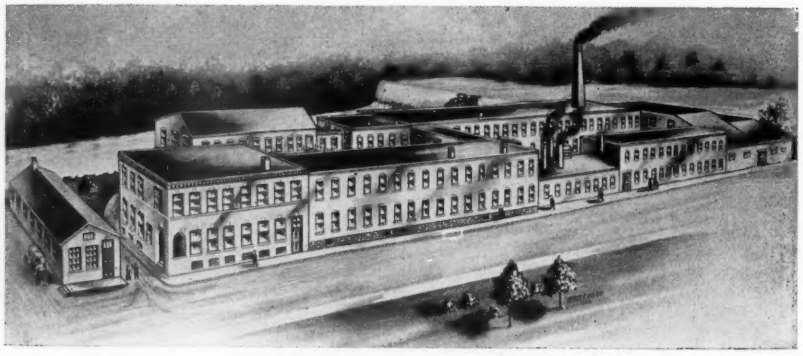

GENERAL VIEW OF PLANT, WINSTED, CONN. ▲ ▲ ▲

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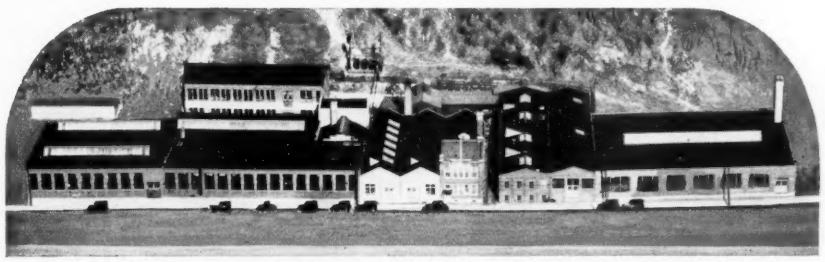

AERIAL VIEW OF PLANT OF HUDSON WIRE CO., OSSINING, N. Y. ▲ ▲ ▲
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"HUDCO" High Conductivity Electric Wire

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BRUSH WIRES, CRIMP and STRAIGHT

Brass, Steel, Nickel Silver, Copper and Phosphor Bronze

TINSEL LAHNS

Silver Plated Copper, False Gold and Copper

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A new process of drawing and annealing is used which produces a wire unusually smooth, clean and uniform in color for enameling and other purposes. ▲ ▲ ▲

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Expert annealing of the wire prevents unnecessary breakage when winding the wire into coils ▲ ▲ ▲

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It costs nothing and involves you in nothing. ▲ ▲ ▲

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"HUDCO" FINE WIRES

Estab. 1902 Estab. 1902

Optical Measurement of Fine Wire

By A. C. Blackall

THE accurate measurement of fine wires and of dies for producing them constitutes a problem of considerable difficulty. Among other troubles encountered is the provisional deformation of the wire in the very process of measurement if any form of screw micrometer be used. These and other difficulties of a similar nature seem to have been successfully surmounted in a very simple yet accurate machine which has recently been patented by Russell Douglas, a Glasgow technologist. One of these measuring machines has just been installed at the Orthological Institute in London.

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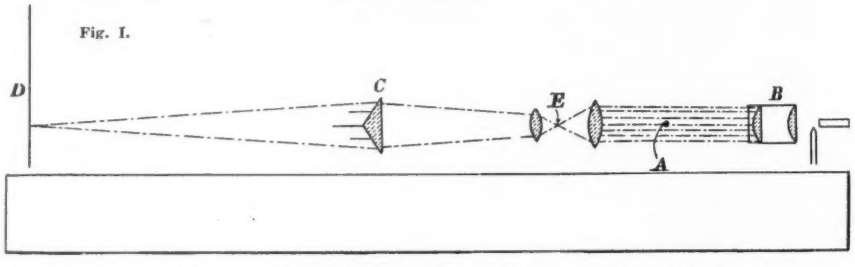
THE machine has been certified by the National Physical Laboratory to measure small wires and the like to an accuracy of 0.00005 in., and it is claimed that, when a few improvements have been made, still greater precision will be secured. The remarkable accuracy of the machine is partly attributable to the fact that the principle on which it is based embodies a null method of measurement, a condition which has long been recognized as specially conducive to accuracy. The general principle on which the machine is based will be best understood on reference to the diagrams. In Figure 1 the specimen to be measured is marked A. This is inserted in a parallel beam of light obtained by sending light from a point source through the condensing lenses shown at B.

✦ ✦ ✦

A SECOND system of lenses, equivalent to the projector of a lantern, is provided at E, and in the absence of the prism C, would give on the screen D a magnified but sharply defined shadow of the specimen. Owing to the interpolation of this prism, two such shadows are formed, provided the prism is far from the screen. By advancing the prism towards the screen these two shadows may be made to coincide, and the appearance is then the same as if the prism were absent. By advancing the prism further, this shadow can be made narrower and narrower until it ultimately disappears in a fine blue line, due to the interference of the light which has come round opposite sides of the object. It is the sudden disappearance of the shadow and the simultaneous

Fig. I.



emergence of this blue line which shows that the instrument is in adjustment. When the instrument has been calibrated once for all, the diameter of any specimen is obtained by simply recording the then position of the prism carriage on the graduated bed over which it slides.

Fig. II.

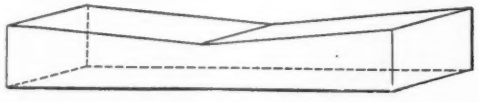


Fig. III.

✦ ✦ ✦

IN the diagram, the prism shown has a much smaller obtuse angle than is used in the actual instrument. In this a very obtuse-angled prism is used, such as is represented in Figure 2. The greater this angle, the greater the displacement of the prism needed to cause the shadow to vanish. It is claimed that though originally designed for the measurement of very fine filaments or of very small holes, the same method is applicable to ordinary workshop measurements. Indeed, with another variant of the instrument, in which the prism takes the form represented in Figure 3, it is claimed by Mr. Douglas that it will be possible to measure the diameter of work in a grinding machine without stopping the machine.

IT will be seen that the measurements do not depend in any way on the accuracy of a screw, and it is claimed that readings can be obtained much more quickly than with any form of screw micrometer. It can moreover, be safely entrusted to the care of semi-skilled men, since it is practically proof against mistakes. Temperature errors are stated to be only one-eightieth of those arising from screw micrometer machines.

✦ ✦ ✦

THE following table, which has been taken from a report by the National Physical Laboratory, Teddington, gives the main results of three sets of observations. These show that the diameters as deter-

(*Please turn to page 237*)

A Review of Recent Wire Patents

No. 1,856,204, COAXIAL CONDUCTOR SYSTEM. Patented May 3, 1932, by Herman A. Affel, of Ridgewood and Estill I. Green, of East Orange, New Jersey, Assignors to American Telephone and Telegraph Company, a Corporation of New York.

In a concentric conductor system, the inventors utilize the space inside the inner wire conductor by filling the conductor with a plurality of ordinary wire cable pairs these pairs being utilized in giving service between intermediate points along the concentric conductor system and may be used to provide spare channels to give temporary service in case the concentric system is disabled.

✦ ✦ ✦

No. 1,856,243, FILAMENT FOR INCANDESCENT ELECTRIC LAMPS, Patented May 3, 1932, by John William Ekstedt, of Belleville, New Jersey, Assignor to Westinghouse Lamp Company, a Corporation of Pennsylvania.

The inventors do not employ a mandrel for the winding of the wire filament, but use a die block having an elongated cavity positioned adjacent an edge thereof, with the bottom surface of the cavity from end to end being concave and the wire to be wound is thrust endwise into the cavity at a point adjacent the end of the same. The curvature is such that the wire when suitably propelled is given a reverse bend or convolution.

✦ ✦ ✦

No. 1,856,444, MEANS FOR FEEDING A WIRE THROUGH A FURNACE, Patented May 3, 1932, by Walter C. Sutton, of Cleveland Heights, Ohio, Assignor to The Lindsay Wire Weaving Company, of Cleveland, Ohio, a Corporation of Ohio.

Particularly, this invention relates to feeding bronze wire employed in paper making belts into annealing furnaces, and the inventor provides an endless feeding wire which passes through the furnace and is provided with attaching means for the bronze wire which is then wound off the bobbin and passes through the furnace in a taut condition.

✦ ✦ ✦

No. 1,856,676, TELEPHONE CABLE, Patented May 3, 1932, by William Kirby Weston, of Sanderstead, Surrey, England, Assignor to Western Electric Company, Incorporated, of New York, N. Y., a Corporation of New York.

So as to reduce the electrical unbalance due to differences in the electrical characteristics of the coloring or marking of conductors in each group, the inventor applies a coloring substance to the paper insulation about the wire conductors in such an amount that the capacity of the conductors of different pairs will be equal, and in such configuration that the individual conductors may be thereby identified.

✦ ✦ ✦

No. 1,857,119, WIRE BENDING MECHANISM, Patented May 3, 1932, by Walther Dalheimer, of Eindhoven, Netherlands, Assignor, by Mesne Assignments, to Radio Corporation of America, of New York, N. Y., a Corporation of Delaware.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 551 Fifth Avenue, New York.

The device is particularly adapted to give two or more simultaneous bends to a length of wire, without the employment of the usual punch and matrix, and so that kinks will not form during the bending operations and will be removed if in the wire at the time of bending.

✦ ✦ ✦

No. 1,857,764, SPRING DEVICE, Patented May 10, 1932, by Charles I. Nygard, of Elmhurst, New York.

For use as a spring for engine starters, the inventor provides a coil spring having a cross section similar to the cross section of I-beams, claiming greater strength for the spring and the employment of more convolutions due to the shape of the wire forming the spring.

✦ ✦ ✦

No. 1,858,306, METHOD OF SWAGING BULBS ON WIRE, Patented May 17, 1932, by Ronald Moreschini, of Pittsburg, California.

This invention relates to the manufacture of nails and screws from continuous lengths of wire. The device is adapted to upset wire at spaced intervals and thereby produce spaced bulbs on the wire which may thereafter be formed into heads of nails and screws, the device being used as an adjunct to a standard type wire nail machine, when the device is placed in a position where the wire therefrom will pass directly into the nail forming machine.

✦ ✦ ✦

No. 1,858,398, APPARATUS FOR HEAT TREATING WIRE, Patented May 17, 1932, by Martin H. Gerry, 3d, of San Francisco, California, and Claude J. Brooks, of Redwood City, California, Assignors to E. H. Edwards Co., of San Francisco, California, a Corporation of California.

Particularly, the invention relates to the "double lead" process of hardening or "patenting" steel wire, and the apparatus includes a hearth having means for confining the flame to a central portion of the hearth bath to avoid burning the wire as it enters and leaves the bath.

✦ ✦ ✦

No. 1,858,414, MACHINE FOR MAKING INDENTED TAPER PINS, Patented May 17, 1932, by Wilhelm Nollenberg, of Dusseldorf, Germany, Assignor to The Firm: Malmedie & Co., Maschinenfabrik Aktien-Gesellschaft, in Dusseldorf, Germany.

Adapted for fastening machine parts, these pins are constructed of wire. According to the invention, indents are pressed into the wire by tools radially shiftable and after advancing the wire for the length of a pin, its top will be worked by cutters provided on a rotating disc, and the pin will be sliced off.

No. 1,858,528, TWISTER OR STRANDER, Patented May 17, 1932, by William E. Somerville, of Coal City, Illinois.

The device is particularly adapted for twisting wire into cables or rope, and the inventor does away with the revolving cage usually employed, and in lieu thereof employs two arms which are disposed at the ends of a cradle fixed against rotation, the arms being rotatable with respect to the cradle to effect the twisting.

✦ ✦ ✦

No. 1,858,772, PARK CABLE, Patented May 17, 1932, by Otto Arthur Frederickson, of Ben Avon, Pennsylvania, Assignor to National Electric Products Corporation, of New York, N. Y., a Corporation of Delaware.

In lieu of steel tapes or cardboard strips as a covering for the jute roving, the inventor employs convolutions of twisted and flattened Kraftex paper.

✦ ✦ ✦

No. 1,859,085, PICKLING APPARATUS FOR RODS, TUBES AND BARS, Patented May 17, 1932, by Charles W. Haller, of Wheeling, West Virginia, Assignor to Wheeling Bronze Casting Company, of Wheeling, West Virginia, a Corporation of West Virginia.

The device is adapted to give the rods, etc., a swinging movement laterally through the pickling fluid and, at the same time, rotate them by alternate tipping of the ends of the cradle or carrier in which the article is held.

✦ ✦ ✦

No. 1,859,086, PICKLING APPARATUS, Patented May 17, 1932, by Fred Hamm, of Martins Ferry, Ohio, Assignor to Wheeling Bronze Casting Company, a Corporation of West Virginia.

This inventor provides means for descaling the rods, etc., and for quickly loading and unloading them with respect to the pickling apparatus.

✦ ✦ ✦

No. 1,859,946, CLIP, Patented May 24, 1932, by William H. Wilson, of Los Angeles, California.

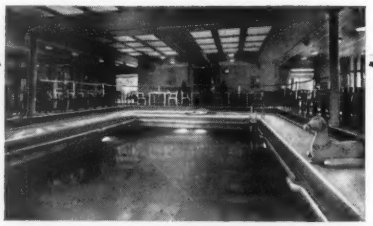
This is a heavy wire clip for floor construction as well as wall construction in re-enforced concrete work, the device being formed with an inverted V and two end locking members, the whole device being formed of a single length of wire.

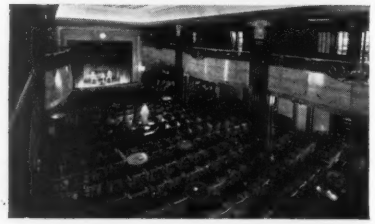
✦ ✦ ✦

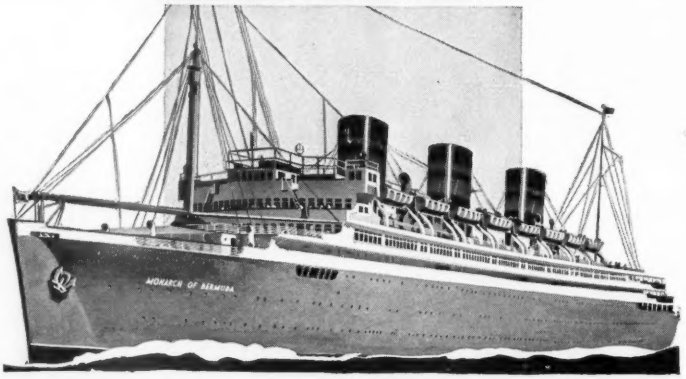
No. 1,860,498, ELECTRICAL CABLE, Patented May 31, 1932, by Leroy Stearns, of River Forest, Illinois, Assignor to Western Electric Company, Incorporated, of New York, N. Y., a Corporation of New York.

This is a division of the inventor's application which resulted in U. S. Patent No. 1,726,551, dated September 2, 1929, and there is provided in the present patent a quadded cable embodying a construction where the direction of the phantom twist of the quads in one layer is opposite to the phantom twist of the quads in the adjacent layer, the stranding of the layers being opposite to the phantom twist of the quads therein.

Will the 1933 Convention of the Wire Association be held on ship-board enroute to Bermuda and return?







If so, the 1933 Convention will probably be the largest and most successful in the Association's history because—

(1) Convention proceedings will be held under ideal conditions of weather and bodily comfort.

(2) Social and entertainment values of the convention will reach a new high level.

(3) Association publicity will be magnified.

(4) The inclusive price of convention attendance will compete with any previous meeting of the Wire Association.

(5) International good will will be strengthened.

AMERICAN INSTITUTE OF INTERNATIONAL RELATIONS

1350 BROADWAY, N. Y. C.

Exports and Imports of Wire

Exports of iron and steel wire products in March, 1932 and April, 1932
(In gross tons)

	April 1932	March 1932	April 1931
Wire rods	1,178	2,733	3,239
Hoops, bands and strip steel	1,743	2,127	3,148
Plain black or galvanized iron or steel wire	1,117	1,397	1,506
Barbed wire and woven wire fencing	2,293	2,562	2,639
Woven wire screen cloth	68	56	84
Wire rope	141	145	279
Insulated iron or steel wire and cable	58	34	9
Other wire and manufactures	160	204	434
Wire nails	781	615	810
Tacks	32	36	50
Other nails including staples	355	412	310
Bolts, machine screws, nuts, rivets and washers	224	266	581
Total, these 12 classifications	8,150	10,587	13,089

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Concrete reinforcement and other bars	6,059	6,816	9,630
Wire rods	276	973	655
Barbed wire	1,390	1,551	499
Round iron and steel wire	223	211	265
Telephone and telegraph wire		1	1
Flat wire and strip steel	84	59	62
Wire rope and strand	202	146	209
Other wire	112	23	63
Hoops and bands	1,889	1,454	1,921
Nails, tacks and staples	995	930	508
Bolts, nuts and rivets	11	7	46
Total, these 11 classifications	11,241	12,171	14,459

EXPORTS of iron and steel products from the United States in April registered their second consecutive gain, their total of 58,118 gross tons being 8,191 tons, or 16.6 per cent, greater than that of March, and 43.6 per cent above the February total. The month's trade was further featured by the ascension of Japan, on the strength of greatly increased purchases of scrap iron and steel, to the position of leading market, thus displacing Canada, which took second place.

✦ ✦ ✦

IMPORTS — 36,239 tons — were 11.4 per cent smaller than in March, this decline resulting from a sharp drop in the receipts of pig iron. The month's trade was also featured by the continued growth in imports of tin plate.

✦ ✦ ✦

THE chief gains in point of tonnage were in scrap (5,791 tons), cast iron pressure pipe and fittings (2,137 tons), tin plate (2,124 tons), and black steel sheets (1,399 tons), while the more outstanding reductions were those in wire rods (1,555 tons), casing and oil-line pipe (1,420 tons), and skelp (1,365 tons).

JAPAN, because of purchases of scrap iron and steel amounting to 16,849 tons, showed a total trade amounting to 18,903 tons in April and for the first time exceeded Canada in the volume of its purchases in a given month. The Canadian total of 13,874 tons—the only one in the five largest individual markets to fail to increase in April—included 1,432 tons of scrap, and 1,030 tons of hoops.

✦ ✦ ✦

SHARPLY increased shipments of tin plate to this country elevated the United Kingdom to first position among the countries exporting ferrous products to the United States. The Belgian total of 8,550 tons was made up almost entirely of merchant steel bars (2,058 tons), concrete reinforcement bars (1,892 tons), sheets (1,652 tons), and structural steel 1,558 tons).

✦ ✦ ✦

THE principal items in the German total of 4,933 tons included 913 tons of nails and 719 tons of merchant steel bars; the French total of 3,116 tons included 558 tons of hoops; while the Canadian total of 1,882 tons was made up in part of 650 tons of ferro-manganese and 559 tons of rails.

✦ ✦ ✦

RECEIPTS of card clothing declined to 5,871 square feet valued at $6,024—5,044 square feet ($4,670) coming from the United Kingdom and the rest from Germany.

✦ ✦ ✦

WIRE cloth and screening imports also declined—to 21,686 square feet—Germany supplying 10,864 square feet, Canada 3,848 square feet, France 3,616 square feet, and the Netherlands 2,524 square feet.

✦ ✦ ✦

FOURDRINIER wire receipts, however, increased sharply, to 99,356 square feet, with Austria supplying 42,462 square feet, France 25,318 square feet, and Germany 23,370 square feet.

✦ ✦ ✦

WIRE fencing and netting imports were somewhat larger in April than in March—that galvanized before weaving totaling 6,760,974 square feet, of which 4,596,449 square feet came from Germany, 1,606,525 square feet from Belgium, and 558,000 square feet from the Netherlands; while that galvanized after weaving amounted to 2,212,622 square feet, including 1,102,050 square feet from Netherlands, 1,101,572 square feet from Germany, and 9,000 square feet from Belgium.

✦ ✦ ✦

IMPORTS of wire heddles were half again as large as 3,055,000 —1,770,000 having come from France, 600,000 from Sweden, 575,000 from Germany, and the remainder from Belgium.

An Article
on the
GALVANIZING
CONTROVERSY
By
W. H. Spowers, Jr.
will appear in the
August Issue

'Round the World With the Wire Industry

Prices of the International Wire Rod Cartel

Since England has passed from the Gold-Standard, the International Wire Rod Cartel bases its prices on French Francs, or on U. S. A. Dollars.

The present selling prices of the International Wire Rod Cartel for the most different ports and places of destination are as follows:

Holland:	ffrs. 649.75 for 1.000 kilos franco S. S. destination.
Dantzig	ffrs. 684.75 per 1.000 kilos C. I. F.
Estland:	Reval: ffrs. 684.75 per 1.000 kilos C. I. F.
Lettland:	Riga: ffrs. 682.20 per 1000 kilos C. I. F.
Denmark:	Kopenhagen: ffrs. 738.40 per 1000 kilos C. I. F.
Sweden:	Goteborg: ffrs. 619.60 per 1000 kilos C. I. F.
	Malmö: ffrs. 619.60 per 1000 kilos C. I. F.
	Stockholm: ffrs. 619.60 per 1000 kilos C. I. F.
Norway:	Oslo: ffrs. 706.45 per 1000 kilos C. I. F.
Switzerland:	for quantities of at least
	100 metric tons sfrs. 133.55 per 1000 kilos
	of 100 - 200 tons sfrs. 132.55 per 1000 kilos
	of 200 - 300 tons sfrs. 132.05 per 1000 kilos
	of 300 - 500 tons sfrs. 131.55 per 1000 kilos
	of 500 tons and more sfrs. 131.05 per 1000 kilos
	franco Basel
U. S. A.:	New York: $ U. S. A. 30.15 per 1000 kilos C. I. F.
	New Orleans: $ U. S. A. 29.85 per 1000 kilos C. I. F.
	San Franzisco: $ U. S. A. 30.40 per 1000 kilos C. I. F.
The Argentine:	Buenos Aires: ffrs. 737.10 per 1000 kilos C. I. F.
	Santa Fe: ffrs. 790.75 per 1000 kilos C. I. F.
Brasil:	Rio de Janeiro: ffrs. 737.10 per 1000 kilos C. I. F.
	Santos: ffrs. 753.70 per 1000 kilos C. I. F.
Chile:	Valparaiso: ffrs. 767.75 per 1000 kilos C. I. F.
Uruguay:	Montevideo: ffrs. 737.10 per 1000 kilos C. I. F.
Venezuela:	La Guaira: ffrs. 858.50 per 1000 kilos C. I. F.
Ceylon:	Colombo: ffrs. 781.85 per 1000 kilos C. I. F.
India:	Karachi: ffrs. 758.85 per 1000 kilos C. I. F.
	Singapore: ffrs. 815.—per 1000 kilos C. I. F.
	Batavia: ffrs. 884.90 per 1000 kilos C. I. F.
	Alexandria: ffrs. 728.15 per 1000 kilos C. I. F.
	Lourenco Marques: ffrs. 953.— per 1000 kilos C. I. F.
	Mozambique: ffrs. 1073.10 per 1000 kilos C. I. F.
	Durban: ffrs. 940.25 per 1000 kilos C. I. F.
	Capetown: ffrs. 889.15 per 1000 kilos C. I. F.
Australia:	Melbourne: ffrs. 919.80 per 1000 kilos C. I. F.
Japan:	Jokohama: ffrs. 691.40 per 1000 kilos C. I. F. Kobe.
	Osaka: ffrs. 707.75 per 1000 kilos C. I. F.
China:	Hongkong: $ U. S. A. 26.50 per 1015 kilos C. I. F.
	Shanghai: $ U. S. A. 26.50 per 1015 kilos C. I. F.
	Over-prices:
For dimensions:	of more than 5½ to 7½ m/m incl. diameter
	ffrs. 15.35, $ U. S. A. 0.60, sfrs. 3.15 extra.
	of more than 7½ to 13 m/m incl. diameter
For square wire:	ffrs. 30.70, $ U. S. A. 1.20, sfrs. 6.30 extra.
For Siemens-Martin	ffrs. 30.70, $ U. S. A. 1.20, sfrs. 6.30 extra.
quality:	ffrs. 48.55, $ U. S. A. 1.90, sfrs. 10.— extra.

British Wire Firm Increases Profits

A PARTICULARLY good report has been issued by Richard Johnson & Nephew, one of the biggest British wire manufacturing concerns. This firm produces iron, steel, copper and other wires and has a capital of £600,000 ($3,000,000).

Despite the fact that general industrial depression throughout the world during the year resulted in reduced selling prices, the volume of trade in wire products showed an increase. As a result, the net profit figure has been increased from £31,914 ($159,570) to £34,990 ($174,950). An ordinary dividend of 7 per cent is being paid, compared with 5 per cent for the previous year. Even after this increase the carry-forward will be raised from £20,384 to £24,137 ($120,685).

✦ ✦ ✦

British Develop New Loaded Cable

IN his comprehensive review of the numerous activities of Siemens Brothers & Co., Ltd., at the recent annual meeting in London, Lord Queensborough, the chairman, announced that, in collaboration with the engineers of the British Post Office, the company had developed an entirely new type of loaded cable which possesses outstanding economic advantages. The firm has been entrusted by the Government with the supply and laying of a cable of this new type for the service between Britain and Belgium.

The new cable, it is claimed, will allow four times as many conversations being carried on simultaneously as is possible with any cable laid between Britain and the Continent It will be completed and laid this summer.

✦ ✦ ✦

U. S. Importation of German Wire Working Machines

IN the "Gazette for Wire Industry" issued in Berlin, vol. 14 of April 6th of this year, there is a report to the following effect:

The importation of wire working machines to U. S. A. in 1931 has amounted to $366,378.00, which is about 3% of the entire imports of machinery. Of the amount named

32% is covered by machinery for making wire nails,

13% for drums and polishing machines for wire nails,

21% for wire fence machines.

✦ ✦ ✦

British Angling for Canadian Wire Rope Trade

IT has been widely suggested in the United Kingdom that something on the lines of complementary production between Britain and Canada, as negotiated by Julian Piggott for the British Steel Export Association, might be considered for the wire rope industry. The question has been gone into for the purpose of ascertaining whether it might be possible to come to an understanding with Dominion makers to produce certain sizes and constructions of rope

and leave certain other sizes, e. g., the smaller, for importation by British manufacturers. The obstacle in this connection, however, is that it is possible to make the smaller sizes of rope on a large machine, and most of the Canadian makers have large machines. In Britain the wire rope makers do not hesitate to use a large machine, if it has no work to do, for making small ropes, although it may not be an economical proposition.

✦ ✦ ✦

IN the Canadian output of wire rope and cable of iron and steel a very large increase has taken place—namely. from 5,100,000 lbs. in 1924 to 19,876,000 lbs. in 1930. As about 120,000,000 lbs. of steel wire is also made in the Dominion import is small. In 1930 Britain did nearly three-fourths of the trade in wire rope, stranded or twisted wire, clothes line, picture or other twisted wire, and wire cables on which she receives tariff preference. Outstanding import items in the wire group last year were:—Steel wire, valued at not less than 2¾ cents per lb., for use exclusively in the manufacture of wire rope, 87,179 cwt., valued at $559,276, mainly from Britain; barbed fencing wire, 78,540 cwt., valued at $205,366, mainly shared between U. S. and Belgium; woven or welded wire fencing, wire cloth or wire netting, $185,000 ($100,700 from U. S. and $54,000 from Britain); twisted, etc., wire and rope or cable, $237,000 (Britain $161,000).

✦ ✦ ✦

THERE have been numerous complaints regarding the incidence of the Canadian duty on wire rope. Formerly the Customs authorities accepted the certified invoice prices of the suppliers as proof of their domestic prices. Not long ago, however, they drew up a price list for various qualities and constructions for application to all wire rope imported into the country, and this has been drawn up irrespective of domestic prices in the exporting countries. The result has been that the total duty—including the dumping duty—precludes the British article from competing with the Canadian.

✦ ✦ ✦

New British Tariffs On Iron And Steel

THE new British tariffs which became effective on April 26, 1932, are in two distinct sections as applied to iron and steel products. On certain finished iron and steel manufactures, including tubes, springs and spring steel, wire, wire netting, wire nails, and cable and rope (except insulated telephone and telegraph cables), screws, nails, tacks, rivets, washers, bolts and nuts, et cetera, the duty has been placed at 20 per cent ad valorem, which is the rate which the British Tariff Advisory Committee proposes to apply as a protection tariff to manufactured goods in general. This duty, as in the case of the other duties on manufactured goods, is imposed more or less indefinitely.

The Tariff Committee, in making public its recommendations for general additions to the tariff on manufactures, announced that in the case of the iron and steel industry they could not lay down even the frame-work of a permanent scheme for this industry without more detailed investigations, and, consequently, with the exception of the finished products listed above which have been placed in the general 20 per cent tariff, they have thouught it desirable to impose the temporary 33 1/3 per cent duty until these more detailed investigations could be made. The market position therefore, will continue to remain uncertain until the Committee has completed its work and made its final recommendations regarding the main body of iron and steel products.

The goods now subject to this 33 1/3 per cent duty will include ingots (except those manufactured from charcoal pig-iron), blooms, billets, and slabs (again except those produced from charcoal pig-iron), sheet and tin plate bars, angles, shapes, sections, et cetera of all kinds, forgings, castings, girders, beams, et cetera, hoop and strip, plates and sheets of all kinds, and horse-shoes.

As regards the effect of these duties on American trade, it may be noted that the total imports of iron and steel products from the United States to Great Britain in 1930 were valued, according to the British trade returns at £1,470,000. Of this quantity special pig-iron represented a fairly small item; and tubes, pipes and fittings, and wire and wire nails, represented a total value of slightly over £300,000. As noted above, these items (1) come under the 20 per cent duty, and the result on the trade will largely, if not entirely, depend on whether or not competitive prices can be maintained in spite of the duty.

✦ ✦ ✦

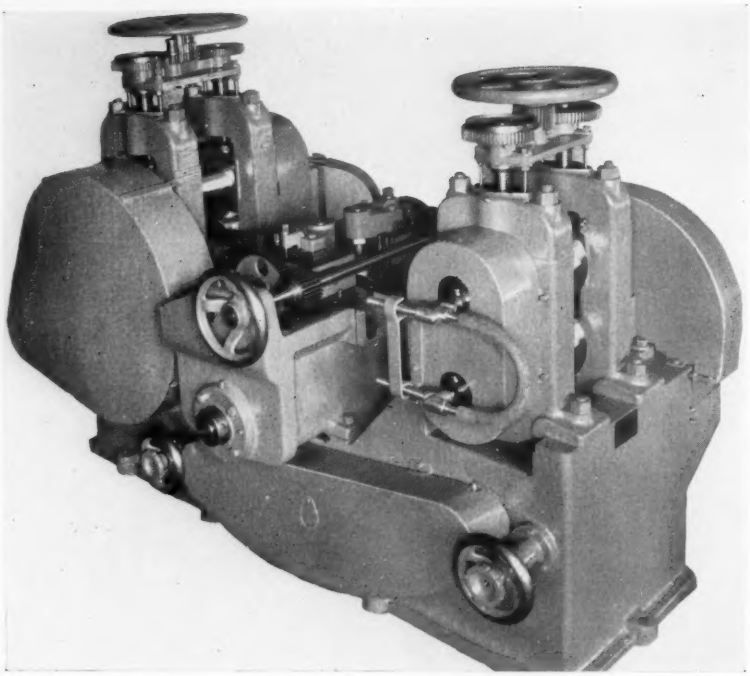
British Coordinate Galvanized Wire Tests

THE British Standards Institution announces that the descriptions given in various specifications of the method of testing galvanized wires by dipping samples in a solution of copper sulphate have been co-ordinated in a single specification, since it has been found that slight variations introduced into the testing routine by individual manufacturers and inspectors had a very substantial influence on the result.

✦ ✦ ✦

THE exact procedure to be followed in preparing the samples and the solution, and the number and duration of the dips in the solution, are prescribed in the new standard specification, and a new combined mechanical and chemical test is introduced, in which the sample of wire is first wrapped round a mandrel of specified size and then unwound and subjected to the dipping test.

Flat Wire Rolling Mill



10″ Breakdown—5″ Edging—8″ Finishing Rolls Driven by 40/50 h. p. 3 to 1 Variable Speed Motor. Capacity 150 to 450 ft. per minute. Wire Straightening rolls, scarfing attachment, guides between rolls and Take-up stand to suit customer's needs.

WE BUILD

Chain Draw Benches—Multiple Coil Winders.

Flat Wire Rolling Mills—Rod Pointers.

Hollow Wire Straighteners and Equipment.

Multiple Strand Bright Annealing Units.

Stranders to Customers' Specifications.

Reelers and Spoolers for all sizes of Wire and Cable.

Reelers and Spoolers for Tinning, Galvanizing, Patenting and Annealing.

Frederick M. Conran

Designer and Builder of Special Machinery

107 Colden Street Newark, N. J.

A New Heat Application for Galvanizing

(*Continued from page 227*)

tudinal chamber running the length of the kettle and equal to one-third of its depth. At the end of the kettle and in the end of this chamber a single diffusion burner is placed and the flame from this burner travels lengthwise along the side of the kettle. An interesting description of this flame is given by C. B. Phillips, vice-president of the Surface Combustion Corporation, in his recent article, "Heat Treating and Forging", from which the following is quoted:

"The process of diffusion combustion . . . possesses valuable characteristics. By this method the hydrocarbons of the fuel gas are quickly heated to a high temperature in the absence of the necessary air for combustion, and this results in liberation of large amounts of fine particles of carbon which float in the flame and absorb heat from that portion of the gas which is actually combusting. The result is that these particles of carbon become intensely heated, and they in turn radiate their heat. . . . It makes possible, therefore, the generation of heat in its most desirable form for high temperature operation, mainly in the form of radiant heat. . . . This progressive burning of the fuel also results in a long flame which is surprisingly uniform in its intensity throughout its length. Thus very uniform temperature distribution in the furnace is obtained.

This uniformity of radiation from the flame possesses the further advantage that any given point in the furnace may be selected for controlling the temperature, with the assurance that a true indication of the temperature of the work may be obtained. . . .

If one were to stand at the end of the combustion chamber and look through it toward the diffusion burner while it is operating one would see a burner approximately the same size as the chamber and its appearance would be

like that of a plate drilled with a series of holes.

These holes are supplying alternately gas and air, and when the burner is lighted one sees a series of ribbon flames floating through the entire length of the combustion chamber each apparently disassociated from the other. These ribbons of flame continue throughout the entire length of the combustion chamber. They are softly inoffensive in appearance and thoroughly progressive in giving off a very soft radiant heat.

It is possible with this type of burner to blanket these flames in such a manner that they do not touch at any point the walls of the combustion chamber. Thus we have what really amounts to a floating heat, progressive in its action and uniform in its heat radiation throughout the entire length of the flame.

Below this combustion chamber there are two further passes for the gases to travel which are built in such a way as to control the heat input along the course of the travel of the heat so that the effect in so far as heat input is concerned is exactly what is desired—high at the top of the kettle, less in the middle, and little or none at the bottom. In the use of this type of burner we have a soft, inoffensive heat source absolutely free from all the impinging difficulties evidenced in other types of settings, and resulting in a graduating, insistent type of heat radiation.

✦ ✦ ✦

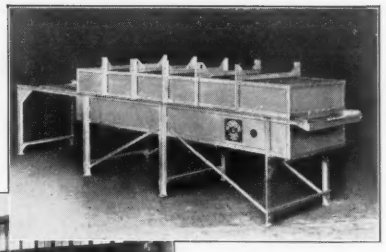
Optical Measurement of Fine Wire

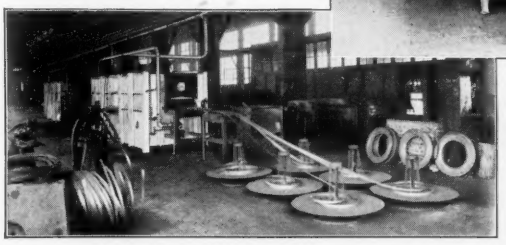
(*Continued from page 230*)

mined from the apparatus agree with the true values generally to within ±0.00005 in.:

True Diameter of Plug Inserted.	Calculated Diameter.	Difference (Calculated minus True Diameter.)
In.	In.	In.
0.03993	—	—
0.06050	0.06049	−0.00001
0.08015	0.08021	+0.00006
0.09911	0.09913	+0.00002
0.18037	0.18041	+0.00004
0.20015	0.20018	+0.00003
0.21036	0.21041	+0.00005
0.30048	—	—

ROCKWELL
FURNACES
ELECTRIC *and* FUEL





FOR FERROUS and NON-FERROUS WIRE PRODUCTS

Complete heating equipment for strand annealing, billet heating and intermediate operations.

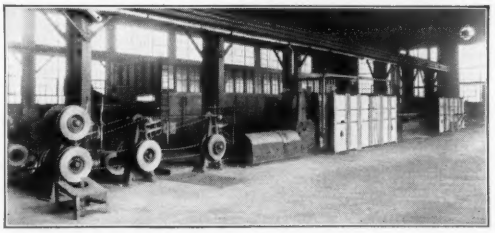
Bright annealing furnaces for ferrous and non-ferous metals.

Write for Catalog 323-B.

"Furnaces to Suit Conditions"

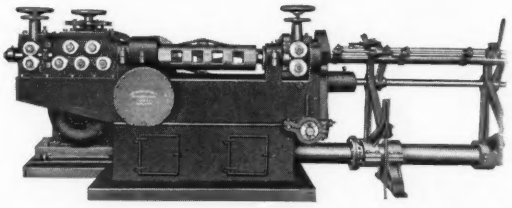
Electricity---Gas---Oil---Coal

W. S. ROCKWELL COMPANY
Industrial Heating Equipment
50 Church St., New York
(Hudson Terminal Building)



Detroit, Chicago, Columbus, Cleveland, Indianapolis, Montreal, Toronto

Shuster Wire Straightening and Cutting Machinery



will be found in all up to date plants, feeding through coil after coil of wire.

Each length is an exact duplicate of the one before it, and the wire is perfectly straight.

Operating costs are extremely low because adjustments are so simple an ordinary laborer can take care of them, with most of his time free for other work. Or, one laborer can take care of several machines.

Catalogue on request.

The F. B. Shuster Company, New Haven, Conn.
Straightener Specialists Since 1866

MICRO-WELD
MODEL K

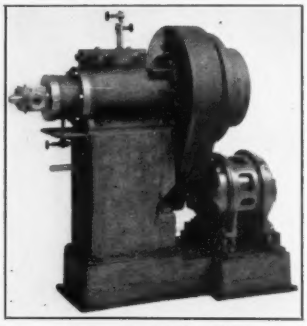
The Welding Machine that makes High Speed, Multiple Block, Continuous Wire Drawing practical.

Precision Built—Automatic

Let us tell you why leading Wire Producers use Micro-Welds.

MICRO PRODUCTS CO.
116 N. Washington St., Peoria, Ill.

European Office, H. A. Schlatter & Co., Zurich, Switzerland



Johnson Super Production Tubing and Straining Machine

REDUCE YOUR RUBBER INSULATING COSTS

Tremendous reductions made in insulating costs by more than doubling production in both straining and tubing operations.

✦ ✦ ✦

Conservative wire insulating capacity of machine of size shown is 20,000 to 50,000 feet per hour according to size and wall of rubber.

✦ ✦ ✦

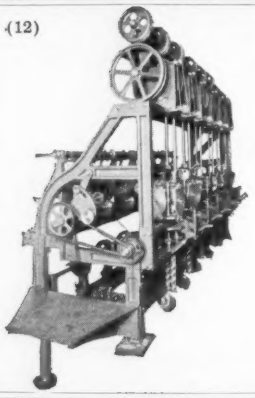
Inquiries will bring complete data and prices.

CORONE WIRE INSULATORS, INC.

Sole Distributors under the Johnson Patents.

Putnam, Conn. U. S. A.

(12)



VERTICAL MODEL TAPING MACHINE

for applying 3 Tapes on each of six lines of wire, for flat or round conductor, with wire straightening rolls and individual traverse for each line of wire; motor or belt drive.

EST. 1855 AIMCO INC. 1915
"American" INSULATING MACHINERY COMPANY
REG. U.S. PAT. OFF.
517 Huntingdon St.
PHILADELPHIA PENNSYLVANIA U.S.A.

WIRE BRAIDING MACHINES

SINGLE, DOUBLE OR TRIPLE DECK

VERTICAL OR HORIZONTAL TYPE

Designed and constructed to insure an efficient and profitable output.

Write for complete information today.

NEW ENGLAND BUTT COMPANY

Dept. W-7, Providence, R. I.

CHICAGO OFFICE—20 NORTH WACKER DRIVE

Steam Heated Rod Bakers

(*Continued from page 225*)

Each track unit requires not over 4 h. p. for fan operation. Applying the above quantity figures to local cost of steam and electricity will give a close approximation of cost of operation aside from handling the stock. Even this latter is held at a minimum, due to constant conditions of treating temperature with resultant regularity in handling the stock.

✦ ✦ ✦

Production Advantages

THE following is a summary of the inherent advantages claimed for this type of Steam Rod Baker:

✦ ✦ ✦

DUE to rapid air movement, more uniform drying and removal of hydrogen and a decrease of both time and temperature of baking are obtained, together with a uniformly baked product.

✦ ✦ ✦

DUE to uniform treatment, the stock can be put through according to schedule, which results in improved efficiency in handling and less storage of stock before and after baking.

✦ ✦ ✦

THE Baker, being entirely self contained, with the heating units on the roof, less total space is required, as compared with other types of Bakers.

✦ ✦ ✦

BEING thoroughly insulated and carrying less residual heat, the cost of furnishing the heat is much lower than for the old coal, oil or gas fired baker.

✦ ✦ ✦

HAVING separated track compartments, each with its own heat generating unit, the baker can be efficiently operated at full or partial capacity.

✦ ✦ ✦

UPKEEP and maintenance cost is at a minimum since standard motors and ball bearing fan shafts are used throughout, and the heating surface requires no attention. Barring violent accident a baker will operate for years with little or no repairs or maintenance.

Wire Industry Vital to Industrial War Planning

(*Continued from page 220*)

(3) Assure an equitable distribution of the burden and profit in the interest of the industry itself.

E. Consider individually, any particular requirements not immediately satisfied, with a view to:

(1) Exploiting unused (slack) capacity.

(2) Conversion of plant capacity engaged in non-essential production to direct war production.

(3) Developing additional capacity by expanding existing facilities or creating new facilities.

(4) Reducing requirements, or establishing partial deferred priorities.

F. Consider raw materials, power, labor and transportation.

G Estimate financial requirements for execution of plan.

H. Establish system of control for opartive features of plan, and channels of communication between industry and procuring agencies.

I. Provide for systematic revision of plan to meet changing conditions.

✦ ✦ ✦

EDITOR'S NOTE

TO accomplish the purposes set forth in this article by Lieutenant Frank W. Bullock, the cooperation of every wire producing plant in the United States is essential. When you receive your copy of the wire procurement details by mail, look it over carefully—select the types or kinds of wire, etc., you are best equipped to produce, fill out the questionnaires and send them in as promptly as possible.

An Article On
High Tension Cable Production
By Otto F. Jagielski
Consulting Engineer
Will Appear in The
August Issue of
Wire and Wire Products

MACHINES
FOR COATING WIRE
with
RUBBER, PLASTIC or FLUX
▲ ▲ ▲
Your Inquiries Solicited
JOHN ROYLE & SONS
Straight & Essex Sts., Paterson, N. J.

BRAND
"B"
Wire Drawing Soap Powder
Made from high titre Palm Oil stock for high carbon drawing.
Proven by test to lower costs and improve efficiency.
Manufactured exclusively for wire drawing by
THE J. T. ROBERTSON CO., INC.
SYRACUSE, N. Y.
Wire drawing soap specialists since 1893.

Metal Spools for Wire Drawing
Metal Spools for Annealing
Metal Bound Spools for Shipping
Metal Bound Reels for Shipping

Hubbard Spool Co.
1620-32 Carroll Avenue
Chicago
Also Sales Representative
STEEL REEL AND SPOOL DIVISION
American Pulley Co. Philadelphia

Patents—Trade Marks

All cases submitted given personal attention by members of the firm. Information and booklet free.

Lancaster, Allwine & Rommel

PATENT LAW OFFICES

Suite 438, 815-15th St., N.W. Washington, D. C.

DIE RECUTTING

ACCURATE WORK FINE FINISH

14 tenths for $1.00—.007 and larger

NO DIE RECUT FOR LESS

Special prices on large lots or on dies less than .007.

WILLIAM HADDOW

17 Eastern Ave. Ossining, N. Y.

"NEP"

New Economic Pickling

✦ ✦ ✦

The only Soluble Inhibitor in Powdered Form on the Market

"NEPOWDER"

We know what the Wire Industry needs to properly Clean Metal and that is

"NEPOWDER"

✦ ✦ ✦

One pound controls 300# of Acid

✦ ✦ ✦

There is no other Inhibitor on the Market produces such a bright finish in Cleaning Rods and Wire.

THE Wm. M. Parkin Company

Chemical Engineers to the Steel Industry 20 Years.

PITTSBURGH, PA.

Convention Notes

THE Machine Shop Practice Division of the American Society of Mechanical Engineers under the chairmanship of F. C. Spencer of the Western Electric Company of Kearny, N. J., have voted unanimously to transfer the program which they had previously planned to hold at the Machine Tool Show in Cleveland to the National Metal Congress at Buffalo, the week of October 3.

✦ ✦ ✦

IN addition to the Machine Shop Practice sessions of the A. S. M. E., the program which had been planned by the Society of Automotive Engineers to be held in Cleveland, has also been transferred to Buffalo.

✦ ✦ ✦

THE combination of these two societies in machinery and machine shop practice will present a splendid outstanding program of particular interest to production men and superintendents.

"HUTTE"

THIS handbook has been published for 75 years, and this is the 26th edition. Originally appearing in a small single volume, it has grown so that the 26th edition appears in 4 volumes. The whole thing is of the general character of Kent's handbook, but not only covers more ground but goes deeper into every subject. It is so highly regarded in Germany that if an engineer is brought into court to answer to charges reflecting on his engineering skill and can prove that he proceeded along the lines laid down in "Hutte" the case is dismissed. Technical schools use it as an advanced text book, and every engineer of German extraction will be found to have one volume at least, of "Hutte" in his desk.

✦ ✦ ✦

IN the present edition vol. 1 covers mathematics, physics, properties of materials, surveying and various tables. Vol. 2 covers machine elements, prime movers, pumps and compressors, machine tools, conveying equipment, lighting and electricity. Vol. 2 is concerned with all construction problems, earthwork, tunnels, concrete, factory and garage building, heating, and ventilation, hydraulic problems, bridge and road building, and ralroads. Vol. 4 takes in shipping and shipbuilding, mining, land cultivation and forestry, food products, hide and leather work, paper, ceramics and glass, gas manufacture, moving picture and radio.

✦ ✦ ✦

"Hutte" is an untranslatable word much used in Germany. Literally it means a small building used for some rude manufacturing purpose, such as a forge, a head shaft shelter at a small mine, or the like. The English word from the same root is "hut". As used in titles it connotes "shop work". As used in this book the impression conveyed is that the engineering data presented is for practical application. As a matter of fact the word became associated with this series of books because they were compiled and published by an old and famous German society in whose name the word appears.

Fourdrinier Wire Cloth

THE printed pamphlet entitled "Fourdrinier Wire Cloth, Commercial Standard CS36-31," recently released, relates to a standard between the manufacturers and users of Fourdrinier wire cloth. This commodity is a flexible, endless, woven-wire cloth used on paper-making machines. Only one grade, known as the commercial standard grade, is specified, and other grades and meshes are to be considered as special. It is the desire of the manufacturers that the one standard shall be of high-grade workmanship and material, and thus, therefore, provide maximum service and satisfaction in use.

In accordance with the recommendations of the standard, the commercial standard grade of Fourdrinier wire cloth shall contain no imperfections that will shorten its period of usefulness or cause a mark or defect in the finished paper. The number of warp and shoot wires for the 10 standard mesh designations are established and the diameters of the wires before weaving are specified.

The standard provides for inspection, method of packing, wording of labels, and marking of shipping cases, proper storage, unpacking, and installation of Fourdrinier wire cloth.

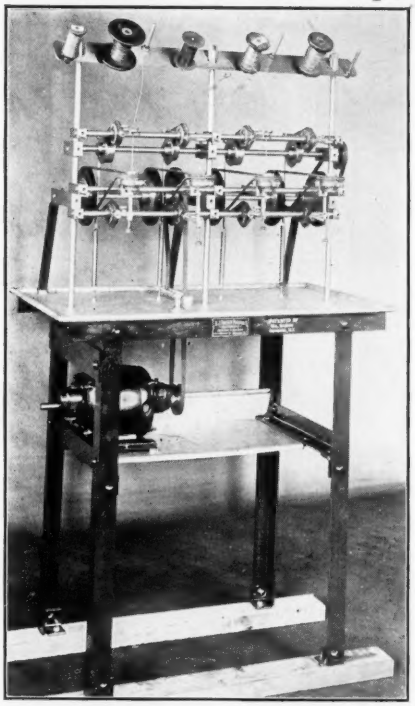
The commercial standard became effective for new production on November 1, 1931, and for clearance of existing stocks on May 1, 1932. Copies of the publication may be obtained from the Superintendent of Documents, Washington, D. C., for 10 cents each.

✦ ✦ ✦

Brazing Alloy For Corrosion-Resisting Joints

Handy & Harman, New York City, have issued a circular on "Sil-Fos" their low melting points brazing alloy, for making corrosion resisting joints on copper brass, bronze, nickel, monel, and other non-ferrous metals and alloys. "Sil-Fos" which contains a small amount of silver, is produced in rods, strip and as a pulxerized material. It blows freely at 1300° F., at which temperature it is extremely fluid.

The Haddow Die Re-Cutting and Polishing Machine will lower your die re-cutting cost to a fraction of present costs



Why do you continue to pay a die cutter and pay for diamond dust to remove a large percentage of your diamond from your dies? Diamond that has done no work—when, by the use of the Haddow Die Recutting Machine you may use practically all your diamonds to draw wire, especially in the small sizes.

ONE MONTH'S SHOP PRODUCTION

Total number of dies cut —1047

Total number of hours required—182.5

Average number of dies per hour—5.73

Number of operators—1

With only one man—This machine will do the work now requiring four to six men in less time and at lower cost.

4 HEAD MACHINE—Also Made in 6-Head size (With 2 Heads for Heavier Dies).

WILLIAM HADDOW
17 Eastern Ave.
Ossining, N. Y.

BALLOFFET

The Quality Diamond Dies

1870 1932

BALLOFFET DIAMOND WIRE DIES CO. INC.,
13-15 East 22nd Street, New York City
Factories in France: Lagnieu-Cluses-Trevoux

American Drop Forging Institute Meets With National Metal Congress

IN addition to the acquisition of the two other technical societies which have transferred their programs to Buffalo, definite arrangements have been made by Charles Smith, president of the American Drop Forging Institute to hold the meetings of the Institute at Buffalo during the National Metal Congress.

THE Institute has two meetings a year, one at which the executives meet and the other at which not only the executives but the industrial and technical men from the forging plants assemble for the discussion of important problems dealing with their particular branch of the industry.

✦ ✦ ✦

IT is this meeting of the technical and engineering forging men which will be held in Buffalo, and several sessions are being arranged of particular interest to forging men.

VIANNEY
DIAMOND DIES
100 FIFTH AVE · NEW YORK

Electric Furnace Co. Acquires Process Engineering & Equipment Corp.

THE Electric Furnace Company of Salem, Ohio announce the purchase of the business of the Process Engineering & Equipment Corp., of Attleboro, Massachusetts, builders of "Preeco" bright annealing and controlled atmosphere furnaces. All equipment, etc., of the Process Corp., has been moved to Salem, Ohio.

The Process Engineering & Equipment Corp., has been specializing on bright annealing and controlled atmosphere furnaces employing a principle which prevents oxidation and the formation of scale by the use of a gas, a mixture of gases, or a vapor to exclude air during heating and cooling. The material is thus removed from the furnace in a bright, clean and dry condition ready for succeeding operation of finishing, thus eliminating dipping, pickling, cleaning, drying, etc.

The Electric Furnace Company is one of the largest manufacturers of furnaces in the world, and is credited with making the largest single installation of electric heat treating and annealing furnaces, (77 in one plant) as well as the largest individual electric furnace —a furnace with 3000 K. W. capacity handling a single charge of 200 tons.

Another large furnace built by this company is the continuous electric furnace for heat treating structural aluminum shapes in the plant of the U. S. Aluminum Company, Massena, N. Y. The inside dimensions of this furnace are 90'x26'. This furnace has 26 automatically controlled heating zones and despite its unusual size, maintains a temporature within 5° plus or minus of specified temperature throughout the entire heating chamber.

The acquisition of the Process Engineering & Equipment Corp., together with the Electric Furnace Company's own newly developed bright annealing process, enables them to offer both large and small production units with controlled atmosphere for tube, sheet, strip, coil, wire, etc., both ferrous and non-ferrous.

WIRE DRAWING MACHINERY AND EQUIPMENT

Rod Frames—16" Frames, 8" Frames —Take-Up Frames, Wire Pointers— Puller Tongs.

General Castings for Wire Mill use.

Circulars on Request.

E. J. Scudder Foundry & Machine Co.
TRENTON, N. J.

Broden Construction Co.
Wire Mill and Cold Rolling Equipment
10255 Harvard Ave.
CLEVELAND, OHIO

THE **Osborn Manufacturing Company,** Cleveland, Ohio, has made an important addition to its activities. A complete line of overhead materials handling equipment, to be known as Osborn Tramrail Systems, has been designed in the new Materials Handling Division.

These Tramrail Systems have been designed to meet practically every condition encountered in the installation of overhead materials handling equipment. There are several exclusive features of design in the equipment for safe and quick overhead transportation of materials. The equipment is built for capacities up to three tons.

J. B. Forker, Jr., is Sales Manager of the Division. He is also in charge of designing the equipment.

Wire Drawing Diamond Dies

COCHAUD
WIRE DIE CORPORATION
300 W. 56th ST., NEW YORK
Tel. Col. 5-1340

W. H. Spowers, Jr.
Consulting Engineer
551 Fifth Ave., N. Y. C.
Specializing in Galvanizing Plants Designed and Installed
Practical Engineering Advice
Vanderbilt 3-7395

OTTO F. JAGIELSKI
Consulting Engineer
167 RADFORD ST., YONKERS, N. Y.
Specializing in manufacture of insulated wire and cable.
Modern equipments and plants designed and installed.
Development work on new machinery, methods and processes.
Practical engineering advice from rod mill to finished product.
Phone: Yonkers 3727

The Waterbury Wire Die Co.

Diamond, Composition and CHILLED IRON DIES
Waterbury, Conn.

BUYERS' GUIDE

For more complete information, consult the annual Directory, Index & Buyers' Guide.

ANNEALING FURNACES
See Furnaces—Various Headings

ANNEALING POTS AND BOXES
National Wrought Iron Annealing Box Co., Washington, Pa.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
John Robertson Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

BAKERS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CASTINGS—Wire Mill
E. J. Scudder Foundry & Machine Co., Trenton, N. J.

CHROME NICKEL—Construction
National Wrought Iron Annealing Box Co., Washington, Pa.

CLEANING & PICKLING EQUIPMENT
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

COILERS—Sheet and Wire
H. J. Ruesch Machine Co., Newark, N. J.

COMPOUNDS—Insulating
Corone Wire Insulators, Inc., Putnam, Conn.

CRANES—Wire Mill
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

DIES—Chilled Iron
Waterbury Wire Die Co., Waterbury, Ct.

All Wire Mill Men Are Invited to Attend

The Wire Association 1932 Meeting and Exhibition

Buffalo, New York

During the week of

October 3, 1932

Special Low Rail Rates

For Information Address

Richard E. Brown, Secretary
551 5th Ave., New York, N. Y.

DIES—Composition
Diamond Die Co., of America, New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Diamond
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Co., New York.
Diamond Die Co., of America, New York, N. Y.
Driver-Harris Co., Harrison, N. J.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York.
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Cochaud Wire Die Corp., New York.
Diamond Die Co., of America, New York, N. Y.
Driver-Harris Co., Harrison, N. J.
Firth-Sterling Steel Co., McKeesport, Pa.
William Haddow, Ossining, N. Y.
Vianney Wire Die Wks., N. Y.

DIES—Recutting and Repolishing Machine
Wm. Haddow, Ossining, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Rod and Tube Drawing
Carboloy Co., Inc., Newark, N. J.
Diamond Die Co., of America, New York, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tantalum Carbide
Diamond Die Co. of America, New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tungsten Carbide
Carboloy Co., Inc., Newark, N. J.
Driver-Harris Co., Harrison, N. J.
Master Wire Die Co., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DRAW BENCHES—
H. J. Ruesch Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

FURNACES—Annealing
W. S. Rockwell Co., New York, N. Y.
Surface Combustion Co., Toledo, O.

FURNACES—Automatic
W. S. Rockwell Co., New York, N. Y.
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FURNACES—Bright Annealing
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FURNACES—Lead Melting
John Robertson Co., Brooklyn, N. Y.

FURNACES—Non-Oxidizing
W. S. Rockwell Co., New York, N. Y.
Surface Combustion Co., Toledo, O.

FURNACES—Wire
W. S. Rockwell Co., New York, N. Y.
Surface Combustion Co., Toledo, O.

GALVANIZING ENGINEER
W. H. Spowers, Jr., New York, N. Y.

GALVANIZING KETTLES—
National Wrought Iron Annealing Box Co., Washington, Pa.

INHIBITORS—
Wm. M. Parkin & Co., Pittsburgh, Pa.

INSULATING COMPOUNDS
Corone Wire Insulators, Inc., Putnam, Conn.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

LIME—Pulverized
Amer. Lime & Stone Co., Bellefonte, Pa.

LUBRICANTS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
J. T. Robertson Co., Syracuse, N. Y.

MACHINE—Die Re-cutting and Polishing
Wm. Haddow, Ossining, N. Y.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
John Robertson Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bunching
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Machinery Co., Philadelphia, Pa.
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

MACHINERY—Chain Making
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Paper Insulated Coils
Universal Winding Co., Providence, R. I.

MACHINERY—Coil Winding
Fred'k M. Conran, Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Universal Winding Co., Providence, R. I.

MACHINERY—Coilers
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
United Eng. & Fdy. Co., Pittsburgh, Pa.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
H. J. Ruesch Machine Co., Newark, N. J.
United Eng. & Fdy. Co., Pittsburgh, Pa.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cutting
Broden Construction Co., Cleveland, O.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.
United Eng. & Fdy. Co., Pittsburgh, Pa.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Extruding
John Robertson Co., Brooklyn, N. Y.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Forming
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Galvanizing Wire
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Gang Winders
H. J. Ruesch Machine Co., Newark, N. J.
Watson Machine Co., Paterson, N. J.

BUYERS' GUIDE, Continued

MACHINERY—Insulating
American Insulating Machinery Co., Phila.
Corone Wire Insulators, Inc., Putnam, Conn.
New England Butt Co., Providence, R. I.
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
John Robertson Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Measuring Wire & Cable
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Panning
American Insulating Machinery Co., Phila.

MACHINERY—Pointing
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rod
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Const. Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
United Eng. & Fdy. Co., Pittsburg, Pa.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. L. Reusch Machine Co., Newark, N. J.
United Eng. & Fdy. Co., Pittsburgh, Pa.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Rubber Strip Covering
Corone Wire Insulators, Inc., Putnam, Conn.
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
Corone Wire Insulators, Inc., Putman, Conn.
John Royle & Sons, Paterson, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila Pa.
Broden Construction Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry and Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Machinery Co., Phila.
Fred'k M. Conran, Newark, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, O.
H. J. Ruesch Machine Co., Newark, N. J.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening Hollow Wire
Fred'k M. Conran, Newark, N. J.

MACHINERY—Stranding
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
United Eng. & Fdy. Co., Pittsburgh, Pa.

MACHINERY—Swaging
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

MACHINERY—Tinsel Rolling Mills
Amer. Insulating Mach'y Co., Phila., Pa.

MACHINERY—Trolley Wire
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.

MACHINERY—Welding Wire
Micro Products Co., Peoria, Ill.
Vaughn Machinery Co., Cuyahoga Falls, O.
F. B. Shuster Co., New Haven, Conn.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Universal Winding Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

PACKING—Metallic Fibre
Hudson Wire Co., Ossining, N. Y.

MACHINERY—Wire Tinning
American Insulating Mach'y Co., Phila., Pa.

POTS—Lead Melting
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Encasing
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

PULLERS—Wire
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
John Robertson Co., Brooklyn, N. Y.

REELS AND SPOOLS—All Kinds
R. B. Hayward Co., Chicago, Ill.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

REEL AND TENSION STAND—
Sleeper & Hartley Inc., Worcester, Mass.

REEL CRUTCHES
R. B. Hayward Co., Chicago, Ill.
Watson Machine Co., Paterson, N. J.

ROLLING MILLS—See Machinery—Rolling Mill

SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
J. T. Robertson Co., Syracuse, N. Y.

STEEL PLATE CONSTRUCTION—
National Wrought Iron Annealing Box Co., Washington, Pa.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Steel Plate
Nat'onal Wrought Iron Annealing Box Co., Washington, Pa.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS
H. J. Ruesch Machine Co., Newark, N. J.

VULCANIZERS
John Royle & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS
American Insulating Mach'y Co., Phila., Pa.

WIRE—Enameled For Coils
Winsted Insulated Wire Co., Winsted, Conn.

WIRE—Nickel Silver and Phosphor Bronze
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.

WIRE—Various Kinds
Hudson Wire Co., Ossining, N. Y.
Seymour Mfg. Co., Seymour, Conn.
Winsted Insulated Wire Co., Winsted, Conn.

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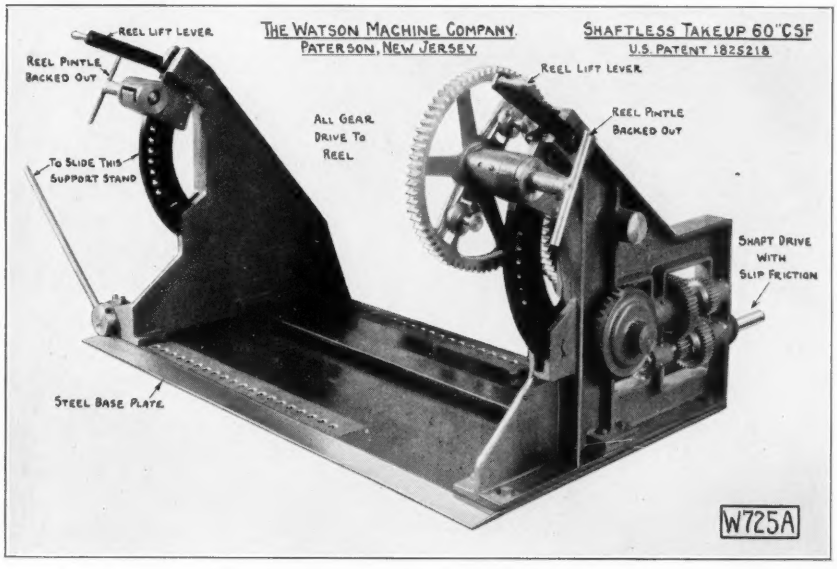
THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

SHAFTLESS TAKEUP "C" (*one man operated*)


REEL LIFT LEVER
REEL PINTLE BACKED OUT
TO SLIDE THIS SUPPORT STAND
THE WATSON MACHINE COMPANY PATERSON, NEW JERSEY
SHAFTLESS TAKEUP 60"CSF U.S. PATENT 1825218
ALL GEAR DRIVE TO REEL
REEL LIFT LEVER
REEL PINTLE BACKED OUT
SHAFT DRIVE WITH SLIP FRICTION
STEEL BASE PLATE
W725A

A Low-Cost Unit Offering The Advantage of Elimination of Reel Shaft

Built standard in two sizes:

Size 60" C picks up 30" to 60" reels of weights up to 6,000 pounds.

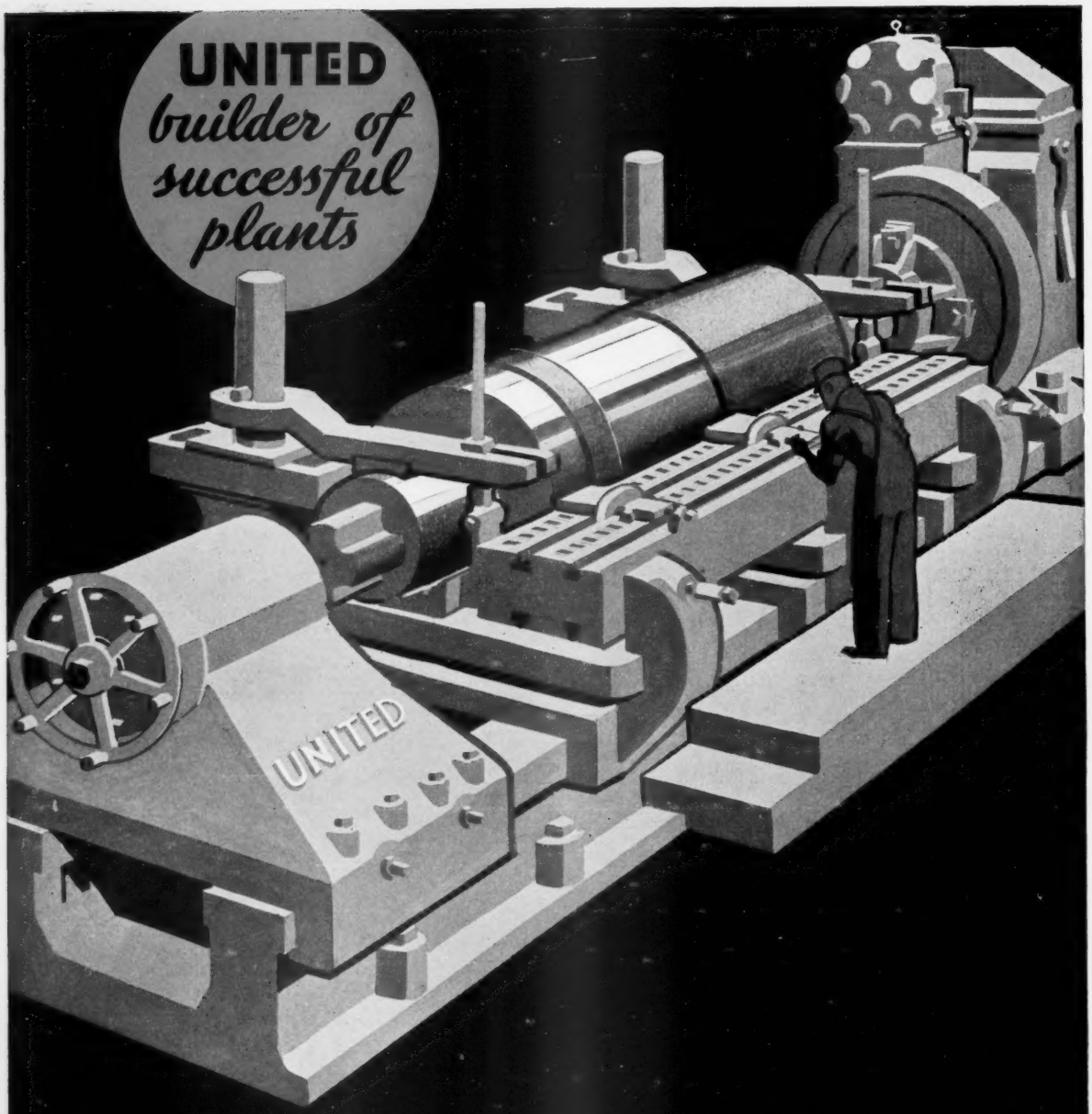
Size 80" C picks up 36" to 80" reels of weights up to 8,000 pounds.

Reels are rolled onto plate, pintles inserted and easily raised clear by the high ratio lift levers.

Gear Drive throughout, with shaft to input point, eliminates hazard and cumbersomeness of belts or chains and loose floor bearings.

Cut gears and bronze bushings throughout. The standard frame allows drive ratio and shaft direction changes.

ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY



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